


ANCIENT PETS. The health, diet and diversity of cats, dogs and monkeys from the Red Sea port of Berenice (Egypt) in the 1st-2nd centuries AD

Marta Osypinska , Michał Skibniewski & Piotr Osypinski


To cite this article: Marta Osypinska , Michał Skibniewski & Piotr Osypinski (2021): ANCIENT PETS. The health, diet and diversity of cats, dogs and monkeys from the Red Sea port of Berenice (Egypt) in the 1st-2nd centuries AD, World Archaeology, DOI: [10.1080/00438243.2020.1870545](https://doi.org/10.1080/00438243.2020.1870545)



To link to this article: <https://doi.org/10.1080/00438243.2020.1870545>

 View supplementary material 

 Published online: 25 Jan 2021.

 Submit your article to this journal 

 Article views: 441

 View related articles 

 View Crossmark data 

ARTICLE



ANCIENT PETS. The health, diet and diversity of cats, dogs and monkeys from the Red Sea port of Berenice (Egypt) in the 1st-2nd centuries AD

Marta Osypinska ^a, Michał Skibniewski ^b and Piotr Osypinski ^a

^aPolish Academy of Sciences, Institute of Archaeology and Ethnology, Warsaw, Poland; ^bDepartment of Morphological Sciences, Warsaw University of Life Sciences – SGGW, Warsaw, Poland

ABSTRACT

Exploration of the ancient transcontinental port of Berenice has enabled us to reveal some of the cultural roots of today's societal bond with 'commensals'; this bond included emotional ties with domesticated animals. The 'pet cemetery' at the port functioned from the mid-1st to mid-2nd century AD. The 585 unearthed burials were dominated by cats, dogs and two species of macaques. At least some of these animals came from outside the African continent. The sex and age profiles of the cats corresponded to those recorded in contemporary urban populations. Among the animals buried at Berenice there featured numerous pathological lesions and diseases that would have prevented unaccompanied survival. Although dogs were mainly of a light, Spitz-type, there was also a taller variant, as well as toy-dogs. The type of burial and furnishings point to the transposition of funerary customs also to pets.

KEYWORDS

Ancient pet animals; cats; dogs; monkeys; Berenice; early Roman Egypt

Introduction

In 2011, we discovered a unique pet cemetery located in the dunes to the NW of the city walls on the outskirts of the Red Sea port of Berenice (Figure 1); it had been established in the 1st century AD during Egypt's early Roman period (Osypińska and Osypiński 2017). Formerly a dilapidated fort, Berenice had already become already by this time an important transcontinental port and commercial trading post for goods from India, Arabia, East Africa, Egypt and Europe (Sidebotham 2011).

This burial ground was entirely different from animal mummy deposits and temple necropolises found in Egypt. Although at Berenice we examined 585 animal burials, not a single mummy was recorded. There was also no trace of the deliberate killing of animals which was widespread in the Nile Valley (Ikram 2007). The features at Berenice that were characteristic and different from temple animal burial sites included both the variety of species and the funeral practices accompanying the burials.

The main question we sought to tackle concerned behaviours in relation to the lives of of ancient 'pets' by which we broadly understood their living conditions, health, the possibilities and range of care provided by human carers, diet, and intra-species variation which would signify selective breeding. Our main research aim was to discover whether non-utilitarian animals, mainly those that played companionship and often religious roles, were afforded special care or whether they

CONTACT Marta Osypinska  archeozoo@o2.pl
 Supplemental data for this article can be accessed [here](#).

© 2021 Informa UK Limited, trading as Taylor & Francis Group

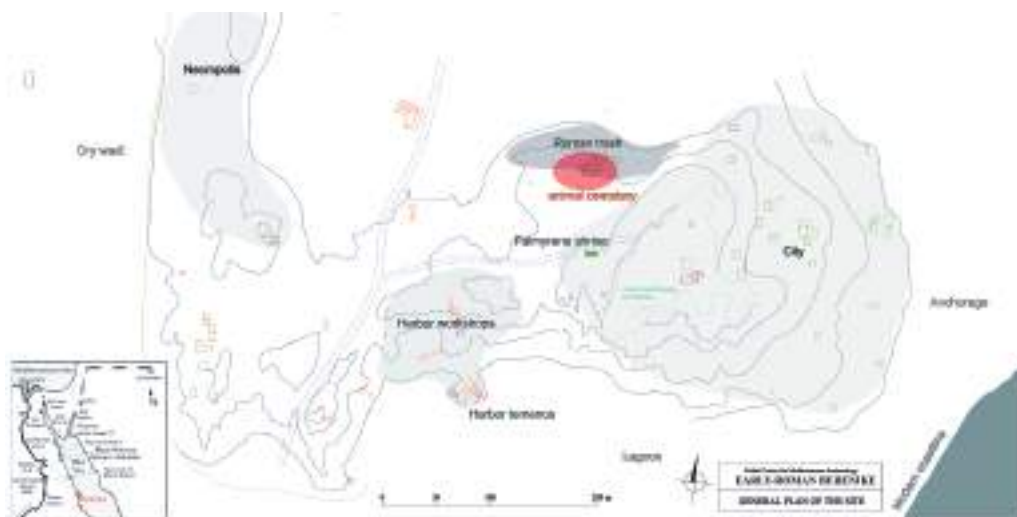


Figure 1. Location and plan of early-Roman Berenice together with the site of its 'pet cemetery'.

lived semi-feral lives as so-called 'occasional commensals' (Hu et al. 2014) in areas of human settlement, living mainly off food waste and rodents. Our research has also thrown some light on the socio-cultural aspects of the establishment and functioning of the burial ground at Berenice – a place of ambiguous cultural rules – 'not very Egyptian' despite its location but 'not very Roman' despite its political and economic control.

The discoveries at Berenice, scientifically significant in their number and quality of materials, have facilitated us in conducting comprehensive osteological, pathological and osteometric analyses. The results of these tests form the basis of broader deliberations on life behaviour and the significance of 'pets' in the North African province of the Roman Empire.

The discoveries in Berenice also contribute much to current debates concerning the status of animals in the ancient world, especially companion animals – 'pets'. Undoubtedly, the modern meaning of the term, especially in highly urbanized, atomized societies, specifies something completely different from the 'companion animals' of ancient communities. Many scholars even argue that the concept of 'pets' was not known at all in the ancient world. Animals would only play utilitarian and economic roles, possibly symbolic-utilitarian in some aspects of religious worship (MacKinnon 2013). On the other hand some sources (mainly texts and art objects) suggest that ancient people often anthropomorphized animals or some of their features (Foegen and Thomas 2017). Other philosophical treatises try to explore the spiritual and social life of animals (Clark 2017). The discoveries at the animal cemetery of Berenice add a whole new perspective and set of arguments.

Archaeological background

The systematic archaeological research which we conducted during the period 2011–2020 covered an area of 104 m² divided into six excavation sectors (Figure 2). In total, we discovered 585 clearly identified bodies of animals. This did not include incomplete secondarily destroyed animal remains; thus the actual number of animals buried was undoubtedly higher.

Based on stratigraphic observations and distinctive historical artefacts (pottery, coins), we distinguished three stages of use in the animal necropolis (Osypinska and Osypinski 2017). However, as

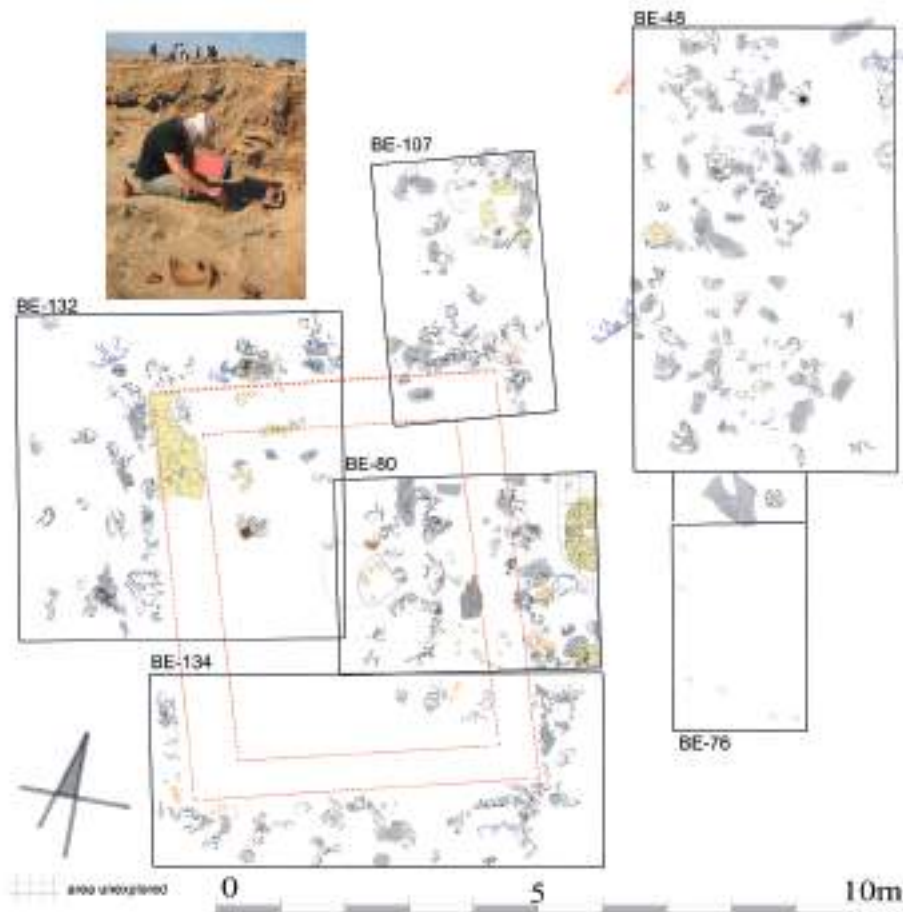


Figure 2. Plan of the 'pet cemetery' at Berenice.

this division only provides a simple time sequence of subsequent burials with imperceptible differences in either form or the species involved, we decided to treat the entire population of animals buried over more than a century together.

One characteristic of the animal necropolis at Berenice, which clearly distinguishes it from most other burial grounds containing animals in the Nile Valley, is the absence of human burials. Although animals were most often buried individually, burials containing two to four individuals were also recorded, most frequently young cats or kittens. However, the burial of a young monkey discovered in the central section of the burial ground was accompanied by the bodies of three cats. Yet another type of pit contained numerous bodies (up to 20), some of them incomplete, and we assume that these burials accompanied subsequent earth works and were secondary in character.

The manner of burial throughout the entire operation of the cemetery was relatively uniform. One clear characteristic feature was the intentional placement of animal in a sleep-like position (Figure 3).

The burials were often protected by pieces of pottery. Besides these, the most frequently recorded additional objects (see additional table S6) were various 'collars', mostly iron, encountered



Figure 3. Manner of placement of the body of a dog, cat and monkey at Berenice.

only on cats and monkeys. We also found examples made in other materials (bronze, organics), as well as necklaces with beads made of stone, glass, faience and shell (Figure 4).

Occasionally, the burials were accompanied by parts of other animals, such as a cow's tail or the wing of a large bird upon which the cat was then placed. The exceptional burial of the previously mentioned young Bonnet macaque contained, apart from three kittens, two large shells deposited alongside its body, including an azure opalescent *Haliotis* shell placed next to its 'face'. Alongside the body we also discovered two large vessel fragments, as well as a grass basket sealed with resin. Under one of the pottery fragments we found the remains of a very young piglet, and a wrapped-up piece of cloth in the other (Figure 4).

Archaeozoological data

We discovered that the necropolis was 91.4% (536 individuals – details in additional table S1) comprised of domestic cats (*Felis silvestrus catus*). Nearby, in a midden examined before 2001, the remains of Asiatic wildcat (*Felis lybica ornata* formerly *Felis ornata*) were found (Ottoni et al. 2017). Only 5.4% (32 individuals) of the animals in the necropolis were domestic dogs (*Canis lupus*



Figure 4. Collars and beads found alongside cats, as well as the accoutrements of a monkey burial.

f. domestica), as well as one young Rüppell's fox (*Vulpes rueppelli*) and one adult Barbary falcon (*Falco peregrinus pelegrinoides*). At the same time, monkeys from the *Cercopithecinae* subfamily constituted 2.7% of the burials. We recorded individuals from two species of genus macaques (*Macaca*).

The age profile of the buried animals varied depending on the species. In the group of monkeys only young individuals were present. The mortality profile was clearly different in the case of dogs. Morphologically, six individuals were fully mature, including one which had lived to an advanced age, that is over 10 years. Due to the large sample present, we were able to assess the age-of-death profile more fully in the case of cats (Amorosi 1989). Indeed, 68.8% of the burials at Berenice belonged to morphologically immature individuals (detailed data in additional table S2).

The state of preservation (presence of *os penis*) allowed us to identify the sex of eleven dogs, divided into seven females and four males. The sex identification of cats is significantly more difficult than that of dogs. On the basis of the presence of *os penis*, as well as skeletal morphological and metric characteristics (Kratochvil 1976), we recorded 62 male and 55 female skeletons. Here, our observations should be treated with reservations – the numbers of individuals of a given sex we recorded should be treated as the minimum number of representatives of a given sex (see the large share of adult individuals of unidentified sex due to the preservation of the skeletons). At Berenice most cats that grew to maturity were males. Due to the young age of the macaques found, it proved impossible to determine unequivocally the sex of the monkeys from Berenice.

The population of both dogs and cats living at Berenice in the first centuries AD was varied. We recorded the most noticeable differences among dogs. Today, on the basis of the height at the withers and morphological characteristics of the skeleton (details in additional table S7), we differentiated three 'morphological groups'. The first comprised dogs over 50 cm in height. We discovered two individuals of this type. The taller of the two, whose height was in the range of 55 to 50 cm (depending on the part of the skeleton on which the height had been calculated), was also characterized by a very elongated dolichocephalic skull. The other dog had a mesocephalic skull and a height range from 49 to 53 cm.

The second group of dogs, the most numerous found to date, were animals whose height hovered around 45 cm. Four individuals of this type were discovered, with a further three coming from other parts of Berenice (Osypinska 2017). These were animals with skeletons of a relatively 'slender' build and slightly elongated skulls.

The third group comprised three individuals – a bitch whose height was in the range of 28 to 30 cm and two fragmentarily preserved skeletons of individuals with a height at the withers of about 24–28 cm. The proportional build of the skeleton and a skull without brachycephalic characteristics indicates that these were the animals of a miniature Spitz type.

Analysis of the osteometric data of the adult cat skeletons indicates that we are dealing with one population, albeit an internally strongly varied one, a phenomenon which is mainly noticeable in terms of osteometry. Analysis of the morphological characteristics of the skeletons indicates that the vast majority of the population did not display characteristics typical of a wildcat (O'Connor 2007). The weakly developed processus angularis of the mandible, its angle with an ascending ramus, the size and shape of the auditory bullae, among other features, point towards a domestic cat. At Berenice, we also recorded both small animals, whose bone dimensions were close to modern European domestic cats, as well as very large individuals, corresponding to some metric parameters of wildcats (see additional tables S3-S5).

We also analysed the osteometric data of cats from Berenice against an analogous bone collection from Myos Hormos (Quseir), 300 km north of Berenice (von den Driesch and Boessneck 1983; Hamilton-Dyer 2013). This clearly indicated that the cat population at Berenice was more varied than that at Myos Hormos where almost exclusively large individuals were mummified. Although, generally speaking, cats from Berenice tended to be larger than European domestic cats, small, medium and very large individuals also occurred. The last of these fit in especially well with the picture of the ancient Egyptian cat population found in the literature (Hamilton-Dyer 2013). On the basis of osteometric data for cats from Saqqara and Balat (Ginsburg 1995, 1995), Hierakonpolis (Linseele, Van Neer, and Hendrickx 2007), as well as Myos Hormos, domestic cats in ancient Egypt were characterized by their large dimensions, which made them rather closer to the European wildcat than the modern domestic cat. The picture of the cat population at Berenice, although generally similar to the characteristics observed in Egyptian cats, seems however to be more complex. This may be due to a strongly discernible sexual dimorphism, with the animals from Berenice reflecting the 'natural' sexual proportions in the population. The clear majority of 'large' animals at Myos Hormos could therefore have resulted from selecting animals for *creating* mummies. A second possibility influencing variation at Berenice was the variety of areas from which the cats were brought, not only the Nile Valley but also other regions and even continents (Ottoni et al. 2017).

Diseases and injuries

Among the 32 dog skeletons discovered, four confirmed the presence of pathological lesions of the skeleton. The largest of the dogs – a male – displayed proliferative lesions on the shaft of the tibia and humerus which were accompanied by an intravital aggressive periosteal reaction (Figure 5). Taking the variety and location of bone lesions into account, along with the morphology of the individual in which it occurred, it may be supposed that it suffered osteosarcoma, the most common primary bone cancer in dogs (Szewczyk, Lechowski, and Zabielska 2015), which mainly affects large-breed dogs. Thus, the individual from Berenice represents a group that modern veterinary medicine considers to be most at risk of this disease.

Another large dog (BE18-19/48/156), the oldest we discovered at Berenice, had advanced spondylosis manifested by the formation of osteophytes on the ventral edges of almost all sections of the spine. In focusing on the advanced process of degeneration, the animal possessed seriously impaired mobility. Although we discovered significantly less advanced spondylosis in a medium-sized bitch (BE19/132/23), it suffered from other serious illnesses characteristic of old individuals, namely periodontal disease and advanced degeneration of the shoulder joints with osteophytes around the head of the humerus and bicipital groove (Figure 6). The location of degenerative lesions in the region of the bicipital groove of the humerus constitutes evidence that the dog suffered from inflammation of the bicipital synovial tendon sheath. The morphology of the left humerus indicated that the bitch had suffered an oblique or spiral fracture of the shaft of this bone (Figure 6). As none of these old dogs were capable of finding food independently, one can conclude that they were entirely dependent on human care.

The fourth dog (BE18-19/48/194) in whose skeleton we recorded pathological lesions belonged to the group of medium-sized dogs. Abnormalities concerned both pelvic limbs (Figure 7). The right femur was clearly shortened while the tibia had fused with the fibula. The left femur had undergone pathological lesions further along, similar to the tibia that was a little too short. As a consequence both knee joints were at clearly different heights, which seriously impaired mobility of the animal. This type of pathological lesion was probably a consequence of a healed oblique fracture of the shaft of the bone with a shortening of its long axis. This is an injury that today is also recorded among dogs in which bone fractures heal ‘side to side’. In this case, at a young age an oblique fracture of the shaft of the femur had



Figure 5. Image of pathological lesions of bones of dog BE11/76/999.



Figure 6. Pathological lesions in the bones of dog BE19/132/23.



Figure 7. Bone fracture in dog BE 18–19/48/194.

undergone shortening as a result of the contraction of the surrounding muscles. A condition of healing for this kind of fracture is leaving the broken sections of bone *in contact*. With the passage of time the bone manages, so to speak, to recreate its primary shape as a result of rebuilding in response to the exertive forces. In the case of the displacement of a significant bone's fragments, a deformity that would remain for the rest of the animal's life, one whose edges would undergo smoothing over time, as happened in the case of the individual from Berenice. The sections of fractured bone possessed rounded edges while the healing process was found to be advanced.



Figure 8. Fish remains in the abdomen of a cat (left) and a dog (right) from Berenice.

We also recorded serious injuries to the limbs causing bodily deformation among cats. This group of injuries included, among other things, fractures of the cervical neck of the femur, transverse and oblique fractures of the femur. In one young individual we recorded a whole set of injuries, namely: damage to the ramus of the right mandible; a fracture of the shaft of the right femur; and a transverse fracture of the bones of the forelimb (the shafts of three bones had fused together at a right angle). Without care, this animal would have had no chance of survival. It is worth stressing that the healing process of the injuries in all cases was at an advanced stage. A frequent complication of joint injuries was both immobility (ankylosis) of the ankle or knee joints, as well as pathological deformation of the metacarpal or metatarsal bones. Undoubtedly, due to their limited mobility, many of these individuals did not have the possibility of survival without care. These fractures could have been the result of being kicked (by people, pack or saddle animals), hit or falling from a height.

The good condition of preservation of some of the burials allowed some identification of the cats' and dogs' diet. Several individuals had large-sized deposits of bones and scales of very small fish in their abdominal cavities (Figure 8). In the case of one individual, this clearly gave the impression that its stomach had been 'stuffed' with such food remains. Another widespread phenomenon among the cats at Berenice were hard 'faecal masses' in the abdominal cavities. Although these could have been trichobezoars, they are more probably evidence of coprostatitis.

The absence of pathological lesions in the macaque skeletons may be explained by assuming that the diseases they suffered from did not leave any skeletal traces. It is probable that they most frequently died at a young age due to difficult conditions of survival at Berenice and challenges in ensuring them a proper diet.

Discussion

Dogs

Morphological variations among dogs resulting from the profile of their use had already appeared in the Bronze Age (e.g. Clark 1995). Numerous depictions from Mesopotamia and Egypt (particularly the New Kingdom) show dogs of mastiff, greyhound or Spitz type, as well as short-legged varieties. The Greeks also had morphological variation among dogs (Clutton-Brock 1981). However, it was the Romans who were the first to apply selective breeding with the aim of gaining desirable morphological and functional traits in dogs, thereby founding the science of cynology (Masseti 2002). Authors from classical antiquity such as Columella and Virgil classified three basic types of dogs, namely: *Canes Villatici*, *Canes Pastorales* and *Canes Venatici* (after: Zedda et al. 2006, 319). Other authors, such as Strabo, Pliny the Elder and Polyaeus (after Lasota-Moskalewska 2005, 349–355) also wrote of *pugnaces canes* – fighting dogs whose traits were analogous to modern mastiffs. Although in this context ancient authors did not mention working animals, small dogs of the toy dog-type were also bred. Significant here is the poetry of Martial (l.109, 1st century AD) eulogizing the positive qualities of Issa, a miniature bitch belonging to Publius, the Governor of Malta. Remains identified as a miniature Spitz of a Maltese type have also been discovered in Yasmin in Tunisia (3rd century AD) accompanying the body of a child (MacKinnon and Belanger 2006).

The dogs discovered up to now were dominated by animals of medium size, a slender build and an elongated skull. Dogs of a similar size lived in ancient times both in Egypt and the Sudanese part of the Nile Valley. The individuals we discovered were slightly smaller than dogs from Nubia whose height ranged from 55 to 60 cm and of a slightly greater mass than the pariah dog common in Egypt (e.g. Chaix 1999 and further literature). The morphological characteristics of the skeletons of medium-sized dogs from Berenice allow one to compare them with a small Spitz dog.

Two individuals at Berenice stood out. The first was taller than average and displayed clear dolichocephalism. The length of the skull of this individual clearly exceeded the value recorded in the population of dogs of northeastern Africa. Morphologically, it was rather similar to modern Mediterranean dogs of the Podenco group or Pharaoh hounds (Coile 2005). Dogs of this morphotype were used for hunting small animals such as rabbits and gazelles.

Another morphologically different dog was a miniature bitch of a Maltese type. It seems appropriate to treat this individual as analogous to ancient ‘toy-dogs’ of a Maltese type. The ‘Maltese’ from Berenice has been the only toy-dog discovered in Egypt until today. Thus, the presence of dogs representing different morphological types in Berenice fits in well with the complex cultural context in which the port there functioned.

On the basis of the morphological skeletal characteristics from Berenice, one may accept that part of the dog population displayed similarities to ‘local’ dogs living in the territory of the Eastern Desert. One must, however, stipulate that dogs with very similar characteristics also occurred in different regions, such as the Indian subcontinent. The presence of macaques or steppe cats at Berenice further suggests that dogs may have been introduced from distant regions, too. The morphological dissimilarity of at least two individuals allows us to assume that they undoubtedly came from beyond the Red Sea coast. These were a miniature Spitz bitch and the dog with a dolichocephalic head, the tallest dog found at Berenice up to now and one buried with great care. The morphological characteristics of this animal suggest that it could be one of the *Canes Venatici*, thus hunting and sporting dogs. The characteristic of dolichocephaly was dominant among, for instance, dogs discovered at Pompeii (Zedda et al. 2006). There too, variation regarding dog morphotypes was found, namely: small dogs (28.7 and 34.4 cm) and large dogs (59.2 and

63.4 cm). On the basis of the data, we can state that the dogs living at Berenice had established morphological characteristics. This leads us to conclude that there was the possibility of the practice of selective breeding with the aim of gaining desired functional or morphological traits. This is a conclusion that fits well the population of dogs at Berenice and our state of knowledge concerning the breeding of dogs during the Roman period, e.g., the evidence of varied morphologies of ancient dogs from Great Britain (Harcourt 1974; Baxter 2006), Italy (De Grossi and Minniti 2000), and Tunisia (MacKinnon and Belanger 2006).

The discoveries from Berenice suggest that dogs were kept less commonly and in smaller numbers than cats, possibly due to difficulties in feeding most predators. However, given that most of them achieved maturity and even old age, one may assume that they were provided with satisfactory living conditions. Attention should be paid to the obvious care that was given to animals afflicted with diseases that not only impaired their mobility (thereby excluding them from 'working' duties), but also their appearance.

Cats

Domestic cats (and steppe cats) were among the animals introduced into Berenice. In contrast with dogs, cats were not (and probably never had been) kept by nomads inhabiting the Eastern Desert. Cats were common animals in ancient Egypt, which is shown by the discoveries from Hierakonpolis (Van Neer et al. 2014), as well as by later iconographic historical monuments. The oldest known depiction of a cat with a collar comes from a tomb at Saqqara (2,500–2,359 BC – Boessnack 1988). Apart from their natural utilitarian role, cats were also pets and later gained a religious significance. Goddesses depicted as cats, namely Mafdet and Mehit, appear in the Egyptian pantheon during the early dynastic period and Bastet slightly later (Malek 1993). The increase in the popularity of votive offerings, including mummified cats, resulted, during the Ptolemaic period, in their production on an enormous scale. This caused, among other things, the deliberate killing of cats (despite prohibitions), as shown by detailed X-ray examinations (Ikram 2007). Although at Berenice we did not record either mummies or evidence showing the deliberate killing of cats, evidence of the Asian wildcat (*Felis lybica ornata*) being introduced into Egypt as an ancient 'centre' of the cat world is extraordinarily interesting – a place where cats became domesticated and played a hugely religious-symbolic role.

As stated above, the results of our research indicate that the population of cats at Berenice was varied. We recorded both small cats, similar in size to European domestic cats, as well as large ones typical of Egypt. At Myos Hormos, situated several hundred kilometres to the north, pieces of several mummified cats containing the remains of exclusively very large individuals were recorded.

The data from Berenice clearly indicate that the overwhelming majority of cats from the animal burial ground were domestic but free roaming (i.e. not completely managed, but they had an owner and came from animals that had been bred). Undoubtedly, those individuals with broken or deformed limb bones could not have survived without human care. Ornaments and collars also testify to the possible belief that they belonged to particular people and to commensal relationships. The recorded remains of stomach contents also show that the animals were fed with 'selected' food.

The age profile of the cats at Berenice possesses a clearly natural character. There is no evidence of human interference in the population, e.g. by killing animals of a certain age. Female cats were very fertile, reaching sexual maturity at the age of 7–12 months and may have been in heat up to five times a year (Organ and Jurek 1997). Research on the age profile of feral populations of modern

cats living in urban environments indicates that the survival rate of kittens during their first year of life is only 1.5 kittens per female. Similarly, cats living around Rome (Natoli 1994) and in the Japanese countryside (Izawa and Ono 1986) show only a 10% survival rate, while this reaches 29% for adult individuals. Researchers examining modern populations of cats indicate that such high mortality rates among kittens are influenced by high population densities in cities, resulting in many young animals suffering from infectious viral and bacterial diseases (Dards 1983). The age profile of the cats at Berenice fits such a picture very well.

The close relationships and care provided to cats is also confirmed by texts discovered at the site of early-Roman Berenice, such as an ostrakon stating: 'Herennius to Saturnilus his dearest, greetings (...) Concerning the cats, Ourses is taking care of them in accordance with what I also wrote you on another occasion. (...)' (after Bagnall, Verhoogt 2005, 83).

Monkeys

Originally, based on knowledge of animals encountered in the Nile Valley (Linseele and Van Neer 2009), we assumed that we were dealing at Berenice with one of the species of baboons of northeastern Africa. A detailed morphological analysis (3D models of the bones compared to the reference collections) clearly showed, however, that the monkeys we discovered had come from beyond Africa. The two macaque species we identified as the most likely (*Macaca mullata* and *Macaca radiata*) live as commensals in the Indian subcontinent, where they are among the most common nonhuman primates (Kumar, Sinha, and Radhakrishna 2013). The zone in which they co-exist is western, central and southern/eastern India. Scientists have clearly stressed the extraordinarily high level of intelligence of these animals (Rajala et al. 2010). Macaques have a very high capability of adapting to a variety of conditions and foods. They are also good swimmers. All of these traits may have significantly influenced the desire to take them on board ship or import them into the Roman Empire. We have not determined whether the motive for this was a desire to possess an animal as a pet or for religious reasons.

Conclusion

In broad perspective, the discoveries from Berenice make it possible to test the theses dominating scientific discourse on the human-animal relationship in antiquity. In particular, the concepts of 'pets' and 'companion animal' need to be a subject of new debate. Of course, one cannot clearly transpose the situation in a socially and culturally specific peripheral port to the general situation in the ancient Roman world. Nevertheless, strong evidence, archaeozoological, veterinary and textual, clearly indicate that the people living in Berenice nearly two thousand years ago looked after 'non-utilitarian' animals in similar ways as today. We are able to clearly identify and recognize the relationships between humans and animals whose only task could have been providing a person with companionship, perhaps emotional entertainment. In this respect, the results of our research enrich our knowledge of the ancient world not only in the field of archaeozoology and veterinary medicine, but also classical archaeology and ancient history.

Our discoveries at Berenice have provided us with a unique possibility to observe the role, significance and relationships of pets within an ancient society occupying an important, albeit peripheral trading centre. This is a unique situation in archaeological research. The fundamental conclusion is a noticeable desire of human beings to be in the company of animals, resulting not only from their functional or economic benefits. Most of the animals had been introduced most

probably deliberately. Insofar as the desire to keep dogs and cats may be explained by the need of their utilitarian 'services', it seems difficult to justify the presence of miniature dogs and macaques on such grounds. Both the careful preparation of the burials, the remains of their diet and incontrovertible evidence of the human care of disabled individuals draws us to the conclusion that dogs, cats and monkeys enjoyed close emotional relationships and deliberate care. This is confirmed by a small number of texts from the period, attesting to the care which animals were given, ensuring their care even in the absence of their owners. In light of this, the burial ground at Berenice is neither typical nor just one of many well-known animal burial sites in Egypt. Irrespective of the motives by which people were directed, they took on the difficulty of introducing, keeping and caring for often sick and disabled animals, often those without 'functional' characteristics. Their variety, both in terms of species and morphology, indicates that they came to Berenice from very different regions, even continents. The discoveries at Berenice testifying to the care pets enjoyed both in life and death has caused us to observe a very close analogy connecting an ancient society isolated in an inhospitable trading centre with modern societal behaviours and the crucial role that small animals play in ever more atomized and urbanized contemporary societies (McNicholas and Collis 2000; Johnson 2011).

Acknowledgments

This research was carried out as part of the project entitled: *Africa-Europe-Asia: the significance of intercontinental trade during the Roman period for the history of farm animals. New archaeozoological data from the Red Sea port of Berenice (Egypt)*, supported by NCN 2016/23/B/HS3/03576. The authors would also like to thank the directors of the Berenice Project, S. Sidebotham, I. Zych and R. Ast (especially the latter for help with English). Both the editorial board and two anonymous reviewers also made our work better.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This work was supported by the Narodowe Centrum Nauki [2016/23/B/HS3/03576].

Notes on contributors

Marta Osypinska is an archaeozoologist focusing on studies of domesticated animals in Northeastern Africa, as well as the hunting strategies of the late Pleistocene societies of Upper Nubia. Her field experience includes cooperation with archaeological teams exploring sites in Sudan (Old Dongola, Baganarti, Selib, Jebel Barkal, El Zuma and the Fourth Cataract) and Egypt (Nabta Playa, Berenike and Wadi Khashab). She has also been Primary Investigator of the projects in Sudan and Egypt financed by the Polish National Science Centre. She has authored numerous papers on ancient animal economy and morphological changes referring to the environmental shifts of the past twenty millennia in Sub-Saharan Africa. Since 2019 she is assistant professor at the Institute of Archaeology and Ethnology, Polish Academy of Sciences.

Michał Skibniewski DVM PhD is an associate professor employed in the Department of Morphological Sciences at the Faculty of Veterinary Medicine of the Warsaw University of Life Sciences - SGGW. Area of scientific interest: morphology of domesticated and free living mammals including animal anatomy, topographical and clinical anatomy as well as environmental toxicology and archeozoology. Doctor Skibniewski also works as a

practitioner in the field of veterinary surgery. Although the majority of his scientific works are concerned with veterinary sciences, he cooperates with archaeologists in the field of morphology of ancient animals.

Piotr Osypinski PhD is a researcher at the Institute of Archaeology and Ethnology, Polish Academy of Sciences. Since 2010 he is a team member of the Berenike Project supervising excavations at the pet-cemetery area. His research interests include lithic technology, adaptation strategies and prehistory of NE Africa.

ORCID

Marta Osypinska  <http://orcid.org/0000-0003-4603-9245>

Michał Skibniewski  <http://orcid.org/0000-0002-9578-2476>

Piotr Osypinski  <http://orcid.org/0000-0001-7843-224X>

References

- Amorosi, T. 1989. *A Postcranial Guide to Domestic Neo-natal and Juvenile Mammals: The Identification and Aging of Old World Species*. Oxford: BAR.
- Bagnall, R. S., and H. C. H. Verhoogt. 2005. "Documents from Berenike. Volume II. Texts from the 1999-2001 Seasons." In *Papyrologica Bruxellensia 33*, edited by J. Bingen, 81–83. Bruxelles: Foundation Égyptologique Reine Élisabeth.
- Baxter, I. L. 2006. "A Dwarf Hound Skeleton from A Romano-British Grave at York Road, Leicester, England, U.K., With A Discussion of Other Roman Dog Types Speculation", [In:] L. Snyder and E. A. Moore (edited by). *Dogs and People in Social, Working, Economic or Symbolic Interaction. Proceedings of the 9th Conference of the International Council of Archaeozoology*, Durham, August 2002. Oxbow Books: Oxford, pp.12–23.
- Chaix, L. 1999. "The Dogs from Kerma (Sudan) 2700 to 1500 BC." In *Historia Animalium ex Ossibus. Beiträge zu Paläoanatomie, Archäologie, Ägyptologie, Ethnologie und Geschichte der Tiermedizin. Festschrift für Angela von den Driesch zum 65*, edited by C. Becker, H. Manhart, J. Peters, and J. Schibler, 109–126. Rahden: Geburtstag, Marie Leidorf Verlag.
- Clark, C. M. 1995. "The Later Prehistoric Dog: The Emergence of Canine Diversity." *AchaeoZoologia* 7 (2): 9–32.
- Clark, S. R. L. 2017. "Animals in Religion." In *Oxford Handbook of Animal Studies*, edited by L. Kalof, 571–589. Oxford: Oxford University Press.
- Clutton-Brock, J. 1981. *Domesticated Animals from Early Times*. London: British Museum (Natural History)/Heinemann.
- Coile, D. C. 2005. *Encyclopedia of Dog Breeds*. New York: B.E.S. Publishing.
- Dards, J. L. 1983. "The Behaviour of Dockyard Cats: Interactions of Adult Males." *Applied Animal Ethology* 10: 133–153.
- De Grossi, M., and J. Minniti, . 2000. *Le sepolture di cani della necropoli di età Imperiale di Fidene-via Radicofani, Roma: alcune considerazioni sul loro seppellimento nell'antichità*, Atti del 2° Convegno Nazionale di Archeozoologia, Asti 14-16 novembre 1997: Forlì, pp.387–398.
- Foegen, T., and E. Thomas, edited by. 2017. *Interactions between Animals and Humans in Greco-Roman Antiquity*. Berlin: De Gruyter.
- Ginsburg, L. 1995. "*Felis Libya Balatensis*. Les Chats Du Mastaba II De Balat." *Bulletin de l'Institut francais d'Archeologie orientale* 95: 259–271.
- Hamilton-Dyer, S. 2013. "Pampered Puss? Cats from the Roman Port of Myos Horos at Quseir. Egypt", B. De Cupere, V. Linseele, and S. Hamilton-Dyeredited by, *Archaeozoology of the Near East. Proceedings of the Tenth International Symposium on the Archaeozoology of South-West Asia and Adjacent Areas. Ancient Near Eastern Studies, Supplement 44*, Peeters: Leuven, Paris, Walpole, pp.357–372.
- Harcourt, R. A. 1974. "The Dog in Prehistoric and Early Historic Britain." *Journal of Archaeological Science* 1: 151–175.
- Hu, Y., S. Hu, W. Wang, X. Wu, F. B. Marshall, X. Chen, L. Hou, and C. Wang. 2014. "Earliest Evidence for Commensal Processes of Cat Domestication." *Proceedings of the National Academy of Sciences* 111 (1): 116–120.

- Ikram, S. 2007. Mummified menageries: Ancient Egyptian animal mummies. *British Institute of Radiology News (Spring 2007)*: 12–13.
- Izawa, M., and Y. Ono. 1986. "Mother-offspring Relationship in the Feral Cat Population and Its Control with a Prolactin Inhibitor, Cabergoline." *Journal of Reproduction and Fertility* 47 (Suppl): 419–424.
- Johnson, R. A. 2011. "Animal-assisted Interventions in Health Care Contexts." In *How Animals Affect Us*, edited by P. McCordle, S. McCune, J. A. Griffin, and V. Maholmes, 183–192. Washington D.C.: American Psychological Association.
- Kratochvil, Z. 1976. "Sex Dimorphism of the Domestic Cat (*Felis Lybica* F. *Catus* L.) On the Skull and on the Mandible." *Acta Veterinaria Brno* 45: 159–167.
- Kumar, R., A. Sinha, and S. Radhakrishna. 2013. "Comparative Demography of Two Commensal Macaques in India: Implications for Population Status and Conservation." *Folia Primatologica* 84 (6): 384–393.
- Lasota-Moskalewska, A. 2005. *Zwierzęta Domowe W Dziejach Ludzkości*. Warszawa: Wydawnictwo Uniwersytetu Warszawskiego.
- Linseele, V., and W. Van Neer 2009. Monkey business: the earliest find of green monkey in the Egyptian Nile Valley, *Nekhen News* 21: 24–25.
- Linseele, V., W. Van Neer, and S. Hendrickx. 2007. "Evidence for Early Cat Taming in Egypt." *Journal of Archaeological Science* 34 (12): 2081–2090.
- MacKinnon, M., and K. Belanger 2006. "In Sicknes and in Health: Care for an Arthritic Maltese Dog from the Roman Cemetery of Yasmina, Carthage, Tunisia", M. L. Snyder and E. A. Moore (edited by) *Dogs and People in Social, Working, Economic or Symbolic Interaction. Proceedings of the 9th Conference of the International Council of Archaeozoology*, Durham, August 2002, Oxbow Books: Oxford, pp.38–43.
- MacKinnon, M. 2013. "Pack Animals, Pets, Pests and Other Non-human Beings." In *The Cambridge Companion to Ancient Rome, Chapter 7*, edited by P. Erdkamp, 110–128. Cambridge: Cambridge University Press.
- Malek, J. 1993. *The Cat in Ancient Egypt*. London: British Museum Press.
- Masseti, M. 2002. *Uomini e (non solo) topi. Gli animali domestici e la fauna antropocora*. Firenze: Firenze University Press.
- McNicholas, J., and G. M. Collis. 2000. "Dogs as Catalysts for Social Interactions: Robustness of the Effect." *British Journal of Psychology* 91: 61–70.
- Natoli, E. 1994. "Urban Feral Cats (*Felis Catus*): Perspective for a Demographic Control Respecting the Psycho-biological Welfare of Rh Species." *Annalidell Istiitute Superiore Di Sanita (Roma)* 30: 223–227.
- O'Connor, T. P. 2007. "Wold or Domestic? Biometric Variation in the Cat *Felis Silvestris* Schreber." *International Journal of Osteoarchaeology* 17 (6): 581–595.
- Organ, C. V., and R. M. Jurek 1997. "Biology and Ecology of Feral, Free-roaming and Stray Cats", J. E. Harris and C. V. Ogan, (edited by) *Mesocarnivores of northern California: Biology, management and survey techniques, workshop manual. August 12-15, 1997*, Humboldt State University, Arcata, CA., The Wildlife Society: Arcata, pp. 87–92.
- Osypińska, M. 2017. "Animal Remains from Berenike, Seasons 2010–2011." In *Berenike 2010–2011. Report on Two Seasons of Excavations at Berenike, including Survey in the Eastern Desert and Reports on Earlier Work*, edited by S. E. Sidebotham and I. Zych, 251–272. Warsaw: PCMA.
- Osypińska, M., and P. Osypiński. 2017. "New Evidence for the Emergence of a Human-pet Relation in Early Roman Berenike (1st-2nd Century AD)." *Polish Archaeology in the Mediterranean* 26 (2): 167–192.
- Otoni, C., W. Van Neer, B. De Cupere, J. Daligault, S. Guimaraes, J. Peters, N. Spassov, et al. 2017. The Palaeogenetics Of Cat Dispersal In The Ancient World; *NATURE Ecology & Evolution* 1, 0139, doi:10.1038/s41559-017-0139.
- Rajala, A. Z., K. R. Reininger, K. M. Lancaster, and L. C. Populin. 2010. "Rhesus Monkeys (*Macaca Mulatta*) Do Recognize Themselves in the Mirror: Implications for the Evolution of Self-recognition." *PLoS ONE* 5 (9): 12865. doi:10.1371/journal.pone.0012865.
- Sidebotham, S. E. 2011. *Berenike and the Ancient Maritime Spice Route*. Berkeley: University of California Press.
- Sweczyk, M., R. Lechowski, and K. Zabielska. 2015. "What Do We Know about Canine Osteosarcoma Treatment? – Review." *Veterinary Research Communications* 39 (1): 61–67.
- Van Neer, W., V. Linseele, R. Friedman, and B. De Cupere. 2014. "More Evidence for Cat Taming at the Predynastic Elite Cemetery of Hierakonpolis (Upper Egypt)." *Journal of Archaeological Science* 45: 103–111.
- von den Driesch, A., and J. Boessneck. 1983. "A Roman Cat Skeleton from Quseir on the Red Sea Coast." *Journal of Archaeological Science* 10 (3): 205–211.
- Zedda, M., P. Manca, V. Chisu, S. Gadau, G. Lepore, A. Genovese, and V. Farina. 2006. "Ancient Pompeian Dogs – Morphological and Morphometric Evidence for Different Canine Populations." *Anatomia, Histologia, Embryologia* 35 (5): 319–324.