

## **The dromedary domestication problem: 3000 BC rock art evidence for the existence of wild One-humped camel in Central Arabia**

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**Abstract.** The paper discusses a rock depiction - probably the earliest - of a one-humped camel (Sha'ib Musamma open-air site, Saudi Arabia, ca. 3000 BC) in the context of the still unclear problem of dromedary's domestication, and the time and place of this. The enigmatic wild ancestor is discussed too. According to our analysis, the depiction shows a scene of hunting a wild one-humped camel - the latest known evidence for the existence of the wild form.

**Key words:** Rock art, Paleozoology, Wild One-humped camel, *Camelus dromedarius*, Domestication

### **Introduction**

Interdisciplinary research in the field of rock art could provide interesting results for archaeology as well as archeozoology and domestication. This paper is a small part of the results of our common project 'Prehistoric Mammals in the Rock Art of Palaeartic Region' and an attempt to contribute to the studies on the domestication of the dromedary and its wild ancestor. A composition, which has not been interpreted from this viewpoint until now provides new interesting data on the matter.

For comparative purposes we have used a typology classifying depictions into pictograms/mythograms, ideograms and psychograms; in the illustrations captions we used area codes suggested by E. Anati and commissioned by the UNESCO – International Council on Monuments and Sites (ANATI, 1993).

### **Location and description of the depiction**

The earliest preserved depiction of a dromedary, or one-humped camel (*Camelus dromedarius*) seems to be the one at Sha'ib Musamma open-air site, Saudi Arabia, ca. 3000 BC (ANATI, 1997). The technique used is plane rock engraving. According to the contemporary (STOYTCHEV, 2001), it is a part of a profile frieze composition representing a hunting scene (Fig. 1). The animal is standing motionless, and seems to have been wounded by four

spears - one stuck deep into the back of the hump and another into the groin; two others are stuck into the thoracic part of the vertebral column but they don't seem to have penetrated deep beneath the skin and hang laterally. Two hunters with bows are aiming at the base of the neck and the left thigh of the animal. A dog on its hind legs is trying to immobilize the camel biting into the upper part of its right forelimb. In the left there is an anthropomorphic figure with a weapon at its waist, making encouraging gestures with its arms. The camel itself looks a large (tall) animal with long limbs, resembling the riding camels of the Sahel desert. Quite realistic, the depiction gives an idea of the exterior of the wild one-humped camel.

Other early (though not that early) depictions of one-humped camels are present, e.g. at Nahal Odem open-air site, Southern Negev, Israel. They are depicted in profile ray-symmetric composition representing a fine nursing scene, which makes us suggest this is an early depiction of already domesticated camel (Fig. 2). The two animals are executed in plane rock engraving technique; they are expressive, finely stylized and dated back between 1900-1350 BP (ANATI, 1997). The stylization of the animals has no significant influence on the precise presentation of their exterior morphology. The female zoomorphic image even has the exact number of tits on its udder.



Fig. 1. Sha'ib Musamma open-air site, Central Arabia. Rock engraving of one-humped camel (*Camelus dromedarius*), part of a hunting scene, ca 3000 BC. *Source:* Redrawn from E. Anati, 1997, p. 99, fig. 69. *Area code:* B-IV

### Analysis and discussion

A potential matter of dispute could be the interpretation of the scene from Sha'ib Musamma as a hunt of a wild one-humped camel. Undoubtedly, this is a hunting scene, but is the animal wild or domesticated? From the viewpoint of formal logic, the latter possibility is not to be neglected and has to be particularly analyzed. In the Neolithic rock art of Egypt there's an interesting precedent: at Jebel Uwenat open-air site a chaotic profile composition of rock engravings is preserved, showing an obvious attempt to kill a domestic long-horned female

cattle (ANATI, 1997). This is not just a cattle-raid, the animal is going to be killed for its meat (Fig. 3). We think this is a story-telling scene, not narrative, as classified by E. Anati. Our interpretation is different too: in the right, two men with the same hair-dresses or hats, one bearing a bow and an arrow and the other a spear, attack the two owners of the cattle depicted in the left, each of them with a feather on his head. The upper left human figure is already wounded with a spear in the thigh and continues fighting, the other protects a long-horned cow and its calf with a bow and an arrow, while the second attacker is throwing his spear to the cow's neck, the trajectory of the spear is represented by the small lines. The importance of the event is emphasized by the identification ideograms for possession (two pairs of triangles) on the cow's body. This depiction is probably the oldest evidence for deprivation of property in the world.

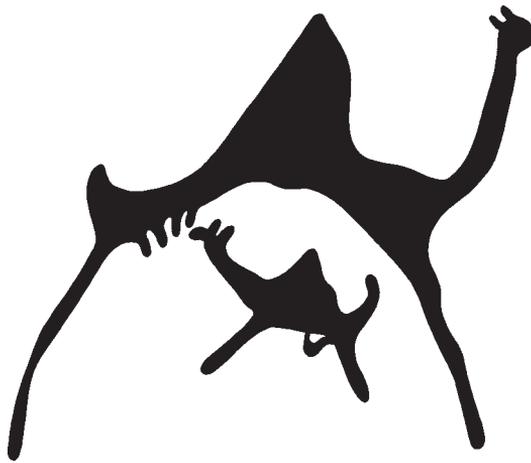


Fig. 2. Nahal Odem open-air site, Southern Negev, Israel. Rock engraving, nursing scene: one-humped camel (*Camelus dromedarius*) with its young, 1900-1350 BP. *Source:* Redrawn from E. Anati, 1993, p. 113, fig. 74. *Area code:* B-III

What makes the two scenes completely different is that one of them is hunting and the other story-telling, one has a dog taking part in the hunt, the other does not. To assume that a dog is used for hunting domestic animals is against Ocam's principle, because dogs are usually used to drive the game to the hunters, and domestic cattle is used to the presence of people and dogs are needed to cut the distance - one could just come near a domestic animal because it does not instinctively expect to be threaten or killed by those taking care of it. For these reasons, we believe that the Sha'ib Musamma scene undoubtedly represents a hunting of a wild one-humped camel.

### **On the origin of dromedary and the problem of its wild ancestor**

The origin of many domestic animals has long been debatable. This holds especially true for the one-humped camel. Supposedly ancestral to the Bactrian camel is the wild two-humped camel, today surviving in the Gobi desert. Despite assumptions that it is secondarily feral or

contaminated by cross-breeding with domestic Bactrian camel, craniometrical research has shown some differences with the latter (BOGOLIUBSKY, 1959). According to some authors, wild (or maybe feral?) two-humped camels were present in the 17th century or even later in Turkmenistan and Tian-Shan (BOGOLIUBSKY, 1959). EPSTEIN (1971) thought that two-humped camel might have been domesticated as early as the fourth millennium BC, but this suggestion is not based on any concrete evidence. As for the dromedary's ancestor, the problem is even less clear. There is no wild one-humped camel in our days. Historical data (see below) could refer to feral animals, and most of the data on earliest domestication are based on no certain evidence. For this reason it has been suggested (some authors still support this view) that dromedary and Bactrian camel have a common origin (from the same species, or mostly two different subspecies) basing upon some embryological peculiarities of the development of the hump and the hybrids fertility (HILZHEIMER, 1926 cited in EPSTEIN, 1971; KÖHLER, 1981). The presence of one or two humps however is a difference of probable important social behavioral demonstrative meaning and indicates a taxonomical differentiation (SPASSOV, 1992). Except for the number of humps, there are other important differences between the two camels: differences in the skull and skeleton, in the soft tissues morphology, the exterior (proportions, development of horny pads on the body, coats), physiology and behavior. Hybrids do have some limits to their fertility (BOGOLIUBSKY, 1959; BASKIN, 1976; EPSTEIN, 1971). All that clearly demonstrates that they originate from different wild species, and not from one ancestral species.

Ancient Greek historians mention the presence of wild one-humped camels in the Arabian Peninsula (EPSTEIN, 1971). We cannot be sure, however, if these were indeed wild camels or feral dromedaries, like recent camels introduced in Australia which are now feral.

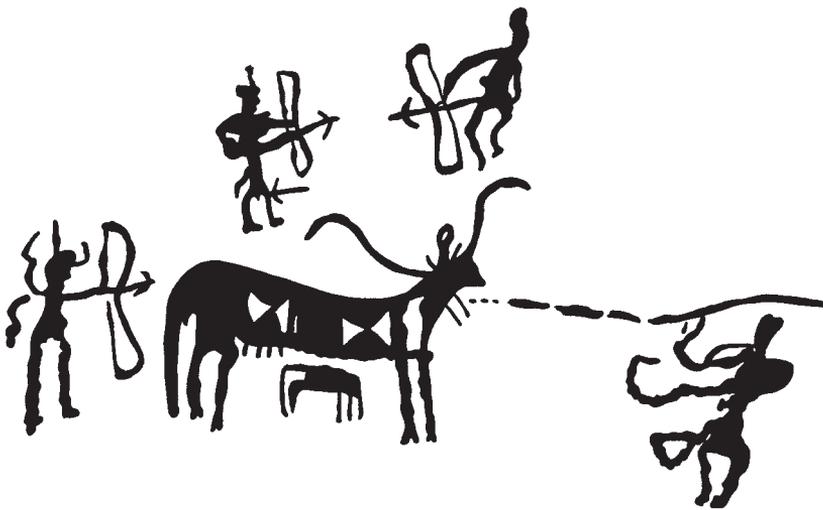


Fig. 3. Jebel Uwenat open-air site, Egypt. Neolithic rock engraving, story-telling scene: killing long-horned female domestic cattle with a spear, Neolithic. *Source:* Redrawn from E. Anati, 1997, p. 155, fig. 122. *Area code:* C-II

Natural distribution area of the domestic one-humped camel is northern Africa and Arabia, Iran, Turkmenistan, Asia Minor to southern Kazakhstan and southern Uzbekistan (BOGOLIUBSKY, 1959). There are no two-humped camels in the prehistoric rock art of the Arabian Peninsula and northern Africa, as well as there are no one-humped camels in the rock art of Central Asia. From the Ternifine site, Algeria, after a maxilla, the fossil camel *Camelus thomasi* Pomel, 1893 has been described. Remains assumed to belong to *C. thomasi* from Northern Africa are known from the Middle and Late Pleistocene from Morocco to Egypt; in the south camel remains are known from the Plio-Pleistocene of Ethiopia (Omo), from Northern Kenya and the Middle Pleistocene levels of Olduvai (Tanzania) (GRIGSON, 1983); it seems they are also known from the Holocene (Neolithic) of Algeria and Mauritania (EPSTEIN, 1971). It's not clear if *C. thomasi* survived in northern Africa. It seems more probable that here the wild camel didn't survive until the penetration of the domestic one, the latter probably coming from the east (EPSTEIN, 1971; BOGOLIUBSKY, 1959). Fossils of Late Pleistocene age assumed to belong to *C. thomasi* have also been found east of Africa, in the Negev desert (GRIGSON, 1983).

A rather controversial problem is how close to the dromedary indeed is *C. thomasi*, as noted in the original description, and if it could be regarded as its wild ancestor. As far as this is practically the only identified wild camel occurring in Northern Africa until Holocene times, *Camelus thomasi* is thought by some authors to be the possible wild ancestor of the dromedary (BARYSHNIKOV, 1981). However, comparative research shows that *C. thomasi* is closer to the Bactrian camel in its bone proportions and size, and maybe some cranial features as well (GAUTIER, 1966; GRIGSON, 1983).

HAVESSON (1954) described after a mandible a separate wild camel subspecies - *Camelus dromedarius dabli* from a locality near the lake Sevan, Armenia, dated ca 3000 BC. Remains are insufficient for a serious analysis of this camel's relationships, but it could be a possible 'candidate' for dromedary's direct wild ancestor. Scarcity of palaeontological data, the presence of a Bactrian-like (according to the data available) wild camel in the end of the Pleistocene of Northern Africa and Negev, and the lack of reliable data on the existence of wild one-humped camels, makes the problem of the dromedary's wild ancestor very uncertain.

### **Time and supposed centre of domestication of the one-humped camel**

Ideas of a very early domestication have recently been criticized. A stated presence of a Neolithic clay figurine of a dromedary on the island of Crete (BOGOLIUBSKY, 1959) has been revised. This figurine is probably from the middle of the second millennium BC (EPSTEIN, 1971), and it is not certain that it represents a camel at all. EPSTEIN (1971) supposed that the dromedary's domestication began during the fourth millennium BC. However, there are no facts to support this opinion.

Animal pottery figurines from Egypt dating from the Predynastic/ Early Dynastic period have been used as evidence for a very early domestication. The hypothesis of the presence of domestic one-humped camel in Egypt in the end of the fourth and the beginning of the third millennium BC is based on these finds. Among the more serious evidence is a terracotta tablet from the Predynastic Period (after EPSTEIN, 1971) necropolis north of Gurna – with a depiction interpreted as a domestic camel led by a rope. From Abusir-el-Meleq site (ca. 3000

BC) is known a camel figurine “carrying a load”; the same figurine is thought to represent a lioness by other authors. In northern Fayum a rope of camel hair has been found, dated at ca. 2600 BC. Strangely enough, camels are almost absent from Egypt depictions until the Ptolemaic Period and begin being widely used only in the Greek-Roman Period. A logical explanation would be that wild camel didn’t survive here until the time of domestication or inhabited regions bordering Predynastic Egypt. The oldest evidence for camels presence could be explained as being sporadic and related to foreign cultural influence (EPSTEIN, 1971). In Mesopotamia (Iran) at Uruk another very old figurine has been identified as a dromedary (age – ca. 3000 BC after EPSTEIN, 1971).

There is no unequivocal evidence for the presence of domestic camels of this age. For this reason, it is assumed nowadays that the dromedary was domesticated mostly 3000 years ago (DAVIS, 1987), and certain evidence is even later. Bone remains cannot show if these are wild or domesticated animals. Camel dung and hairs dating 2600 BC have been found in Iran at Shar-i Sokhta. This is accepted by some authors as the earliest evidence for the camel’s domestication, but it could be a two-humped camel (CLUTTON-BROCK, 1981). Of interest are archaeological data on the presence of camels (unidentified at the species level, but maybe dromedaries) from Mohenjo-Daro, India, 2300 BC (DAVIS, 1987).

Indirect evidence shows that the most possible initial centre of dromedary’s domestication is the Arabian Peninsula (EPSTEIN, 1971; KÖHLER, 1981; DAVIS, 1987). This is also supported by the here discussed rock art images of wild camels from the second millennium BC at Nahal Odem open-air site and the wild camel depiction from 3000 BC at Sha’ib Musamma open-air site.

It remains unclear if the latter could represent *C. thomasi*. It is known that this animal was very large, especially the remains found at Negev (GRIGSON, 1983). If we assume that in this hunting scene the artist tried to keep the proportions between the size of the camel and the men, then maybe the gigantic stature of the animal is not accidental? On the other hand, could we expect that *C. thomasi* is indeed a one-humped camel, if it’s skeleton is closer to that of *C. bactrianns*, as usually assumed?

### General conclusions

Discussed rock art images support the suggestion that the centre of one-humped camel domestication was the Arabian Peninsula. The depiction at Sha’ib Musamma in Saudi Arabia is of particular interest because it seems to show the dromedary’s direct wild ancestor, an animal practically unknown. Still unknown remains the taxonomic status of this wild ancestor as well as the question if the depicted animal could be *C. thomasi*, or the enigmatic *Camelus dromedarius dabli*.

The depiction is an indirect testimony that the purpose of camel’s domestication was initially its meat (contrary to other opinions, see KÖHLER, 1982) as is the case with most other domesticated ungulates. There are two possibilities:

1. The depiction dates from the very beginning of domestication. At the time of the earliest domestication of the one-humped camel – ca. 3000 BC, at the most probable centre of domestication (or close to it) wild camels were still hunted for their meat. In such case,

most probably the hunters were not the same people who domesticated the one-humped camel. Similar examples could be given with horse, sheep and goat. Supporting this is a conclusion by ANATI (1997), according to whom both hunting nomad tribes and herdsmen tribes created rock depictions in Sinai and Arabia by the time of the Sha'ib Musamma hunting scene.

2. The depiction dates from the period immediately before domestication.

It's quite possible that authors recently claiming that domestication began in Arabia about 3000 BC or even later are right. One should bear in mind that reports on the presence of domestic dromedaries 3200 – 3000 BC in Egypt and Mesopotamia, and 2600 BC in Libya (periphery of the domestication centre?) are not based on any certain or direct evidence. Assuming that the relative style dating by ANATI (1997) of the hunting scene at Sha'ib Musamma is correct, then the scene should be related to the end of the hunting period, immediately before the beginning of domestication (at least in the central part of Arabian Peninsula). Such a suggestion seems quite probable: domestication is usually related to (at least partially) settled way of life (on camel in particular see also KÖHLER, 1981). Such a mode of life creates the conditions needed for animal husbandry, while the people who created the discussed hunting scene were probably still hunters-nomads.

In both cases, this depiction is probably the latest of preserved evidence for the existence of wild one-humped camel in the region related to the centre of its domestication.

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**Свидетелства от скалното изкуство (3000 години пр. н. е.) за съществуването на дивата едногорба камила в Централна Арабия и въпросът за времето на одомашняването на громегара**

Николаї СПАСОВ, Тодор СТОЙЧЕВ

(Резюме)

В изследването се привеждат нови данни, чрез анализ и интерпретации на праисторическо скално изкуство, за едни от най-късните свидетелства за съществуването и външния вид на дивата едногорба камила. Те аргументират присъствието на дива едногорба камила в Саудитска Арабия през III хилядолетие пр. н. е. Направен е и анализ на хипотезите и аргументите за одомашняването на едногорбата камила, причините, времето и мястото на този процес според археологически и остеологични материали.