

SEA AND CONTINENTAL TURTLES AND CROCODILES IN A SITE OF THE THIRD INTERMEDIATE TO LATE PERIOD SETTLEMENT IN NORTHERN SINAI, EGYPT

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Introduction

Tell el-Ghaba, a site in north Sinai (Egypt), has been surveyed by the Argentine Archaeological Mission since 1995. The pottery used as the main chronological indicator dates Tell el-Ghaba from the end of the Third Intermediate to the Early Saite Period (Lupo, this volume). North western Sinai – the ancient Eastern Delta – was a frontier area, the land bridge between Egypt and the Levant, where the so-called “Ways of Horus” were and where many settlements were found. Tell el-Ghaba is one of these settlements, located on the North shore of a lagoon between Tell Hebwa and Tell Qedwa (Plate II). Tell el-Ghaba was located near the Pelusiac branch of the Nile, in the easternmost section of the Delta. The Pelusiac branch collapsed in the Middle Age, dramatically affecting the distribution of aquatic fauna, which became restricted to more western areas.

As a result of the fieldwork conducted by the Argentine Archaeological Mission,³ more than 11000 vertebrate bone remains were recovered and studied.⁴ Vertebrates included fishes, reptiles, birds, and mammals. Fishes have been described by Cione.⁵ Reptilian remains did not form a major component of the assemblages but became an important additional source of information. In this paper, we describe and figure the continental and marine reptilian taxa of Tell el-Ghaba, discuss its possible provenance, comment on its symbolic value, and compare it with other sites.

Methods

Vertebrate bones were either picked by hand or collected by sifting the excavated earth of the occupation layers. More than 11000 vertebrate bones (including more than 9700 fish bones) from 192 loci were analysed.⁶ There is still a large amount of bone material to be examined from several other loci. The faunal material is kept in the Argentine Mission storage room, located in the

Archaeological Centre at Abu Seifa, Sinai, where it has been studied. The material was compared with that of the privately held osteological reference collection of Alberto Luis Cione, the collections of different institutions (the Senckenberg Museum of Frankfurt, the Natural History Museum of London, the American Museum of Natural History of New York, the Museo de La Plata of La Plata, the Museo Argentino de Ciencias Naturales “Bernardino Rivadavia” of Buenos Aires), and with bibliography. The simplest method of estimating frequencies of taxa is to count the number of identifiable specimens (NISP) for each species in the assemblage. This approach is biased in favour of species which possess large numbers of robust and easily recognised bones.

FAUNA

Order Testudines Family Trionychidae

There are five genera of Trionychidae in Africa (see Loveridge and Williams 1957). Four of them are included in the subfamily Cyclanorbinae and one in Trionychinae.

Subfamily Trionychinae

Genus *Trionyx* (Geoffroy Saint Hilaire, 1809)
cf. *Trionyx* cf. *triunguis* (Forskal, 1775)
(Figure 1.E)

Material. Dorsal plates: Area VI, Level III, post-Building F, L0507; (2 plates), Area II West, Level III, L1001, final destruction layer; (1), Area II West, Level III, L1001, final destruction layer; (2), Area I, Level V, Workshops, L0163; (1), Area II East, Level II, Building L, L1417; (1), Area I, Level VI, L0170; (1), Area I, Level V, Workshops, L0193; (2), Area I, Level IV, Building B, L0247; (1), Area I, Level V, Workshops, L0057; (2), Area I, Level IV, Building B, L0126; (7), Area I, Level III, loci between Building A and Building B, L0289; (1) Area III, L2003; (7), Area I, Level V, Workshops, L0018; (2), Area I, Level I, strata below Building A and Structure G, L0079; (1), Area I, Level IV, Building B, L0055; (5), Area I, Level IV, Building B, L0103; (1), Area I, Level V, Workshops, L0197. Caparace: Area II East, Level I, strata below Building L, L1410. Beak, Area VI, Level I, pre-Building F, L0511.

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2. Museo de Historia Natural de San Rafael, Mendoza, Argentina.

3. Fuscaldo 2006.

4. Cione 2006a, b; Kohen, Cione 2006.

5. 2006a and b.

6. Cione 2006a.

Remarks. The skull, shell, and axial and appendicular skeleton⁷ are essential to accurately determine a trionychid. In spite of the fragmentary material found at Tell el-Ghaba, it is assigned to cf. *Trionyx* cf. *triunguis* because of, 1) the morphology of the alveolar surface and the extension of the dentary symphysis are similar to that of *Trionyx triunguis*;⁸ 2) the ornamentation of the external surface of the nuchal plate, covered with anastomosed crests is characteristic of Trionychinae;⁹ 3) the proportions and morphology of the nuchal plate agree with those of *T. triunguis* and the size is comparable with that of large individuals of this species.¹⁰

Finally, the soft shelled species *Trionyx triunguis* is the sole species of the subfamily Trionychinae that occurs in Africa (Loveridge and Williams 1957) and it is very likely that the material found at the site corresponds to this species.

Family Cheloniidae
Cheloniidae indet.?
(Figure 1.A and B)

Material. A neural plate from Area II West, Level III, L1025. A lateral pleural plate with the rib attached from BF/68, L1135.

Remarks. The fragmentary material – an hexagonal neural plate and a pleural plate – is not adequate to recognise the characteristics of the family Cheloniidae sensu Hirayama (1994). However, indirect evidence such as the plate ornamentation (simple dicotomic grooves), the large size, and the geometry (hexagonal shape with short anterolateral margins) separate these species from the trionychids. Additionally, the proportions of the neural plate are similar to that of the middle series of marine turtles *Chelonia mydas* or *Caretta caretta*. Indeed, the lateral margins of the pleural plate and the pleural rib that become thinner distally might indicate the occurrence of peripheral plates.

Order Crocodyliformes
Family Crocodylidae
Genus *Crocodylus*
Crocodylus sp.
(Figures 1.C, D and F)

Material. Vertebrae: (1), Area I, Level V, Workshops L0174, ; (1), Area I, Level VI, L0001, Area I, Level II, L0372. Half of an osteocute: (1), Area I, Level VI, L0001, final destruction layer.

Remarks. Until recently, all crocodiles in the Nile system have been classified as *Crocodylus niloticus*. However, a phylogenetic analysis of mitochondrial and nuclear markers, as well as a karyotype analysis of chromosome number and structure concluded that there

are two cryptic species involved.¹¹ Samples were collected from throughout Africa, covering all major bioregions using specimens from museum collections, including mummified crocodiles from the ancient Egyptian temples at Thebes and the Grottes de Samoun, to reconstruct the genetic profiles of extirpated populations. The analyses reveal a cryptic evolutionary lineage within the Nile crocodile that elucidates the biogeographic history of the genus and clarifies long-standing arguments over the species' taxonomic identity and conservation status. An examination of crocodile mummy haplotypes indicates that the cryptic lineage corresponds to an earlier description of *C. suchus* and suggests that both African *Crocodylus* lineages historically inhabited the Nile River.¹² *C. suchus* seems to have recently gone extinct from suitable habitats in the Nile, perhaps because *C. niloticus* grows bigger and is far more aggressive. Consequently, as both species cannot presently be distinguished by the shape of vertebrae or osteocutes, the specimens from Tell el-Ghaba identified as *Crocodylus niloticus*¹³ should be classified as *Crocodylus* sp.

Faunal analysis

We assume that all vertebrate remains are related to human activities because we did not find evidence of natural accumulations. The site was quite above the upper level of Nile floodings, at least when the mud-brick buildings were erected (Area I, Level III). Tell el-Ghaba was probably flooded during the deposition of Level I in Area I (lowest) and perhaps Level II. The inhabitants of the site consumed large quantities of fish.¹⁴ There seems to be no important variation through the successive levels. We also found smaller quantities of birds (5.31%) and mammals (6.20%).¹⁵ The reptiles constitute 1.41% of the vertebrate fauna. Freshwater turtles (*Trionyx triunguis*) are most common (1.22%), followed by crocodiles (*Crocodylus* sp., 0.03%) and marine turtles (0.16%). We did not find other reptilians occurring in different archaeological sites such as the Nile monitor (*Varanus niloticus*), the plated lizard (*Gerrhosaurus* sp.), or the rock python (*Python sebae*).¹⁶

Distribution and Ecology

Trionyx triunguis

The soft shelled turtle occurs in marshes, lakes, and rivers in Africa from Mauritania and northern Namibia to Somalia and Egypt, and along the Mediterranean coast of Turkey, Siria and Israel.¹⁷ Some specimens of *T. triunguis* are found in marine waters away from the Nile Delta, even in the Mediterranean coasts of Syria, and Israel.¹⁸ *Trionyx*

7. See Broin 1977; Meylan 1984, 1987.

8. Broin 1977: pl. 7, fig.4.

9. See Broin 1977: 119.

10. Villiers 1958.

11. Hekkala *et al.* 2011.

12. Hekkala *et al.* 2011.

13. Cione 2006a.

14. NISP: 87.04% of total archaeofauna; Cione 2006a.

15. Cione 2006a.

16. See Peters 1995.

17. King, Burke 1989; Iverson 1992.

18. Pritchard, 1979.

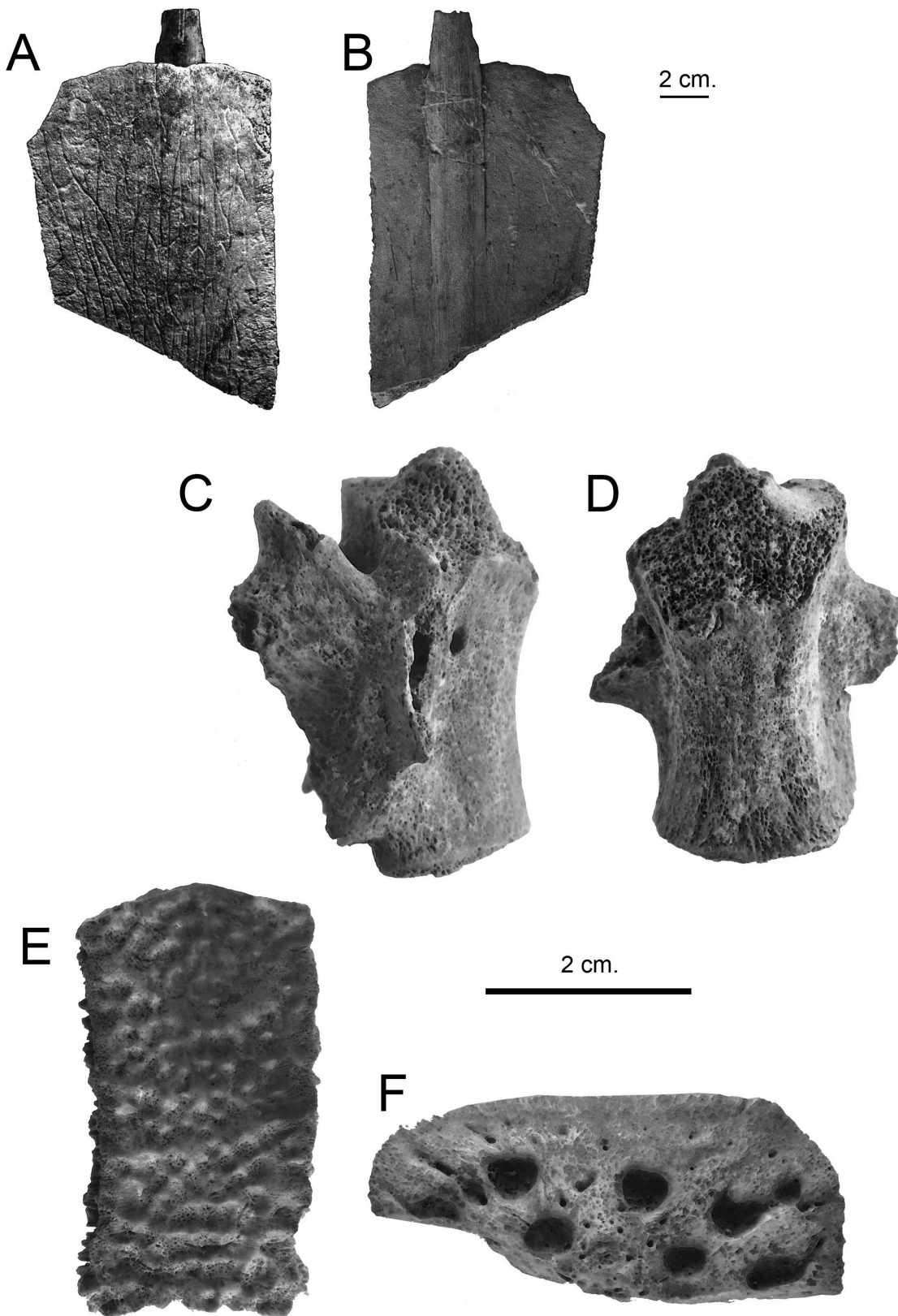


Figure 1. Cheloniidae indet. A, dorsal lateral plate with rib in ventral view; B, dorsal lateral plate with rib in dorsal view (BF/68, L1135). *Crocodylus* sp., C, vertebra in lateral view; D, vertebra in ventral view (BA/41, L0174); E, half part of an osteocute in dorsal view (AZ/41, L0001). *Trionyx tryunguis*, F, partial dorsal plate in dorsal view (BD/69, L1420).

triunguis is an omnivorous species.¹⁹ Mollusks, frogs, fish, insects, and even dates have been registered as stomach contents.

Cheloniidae

Cheloniids are a group of circumtropical marine turtles. They migrate seasonally in search of temperate areas. Two species (*Caretta caretta* and *Chelonia mydas*) are frequently detected in the eastern Mediterranean and especially in Egyptian coasts. The loggerhead sea turtle (*Caretta caretta*) is regularly fished in Egypt.²⁰ It was commonly sold as food in the Alexandria and Port Said markets until recently.²¹ There is conclusive evidence that both cheloniids, *Caretta caretta* and *Chelonia mydas*, nest on the Mediterranean coast of the Sinai peninsula, primarily to the East, in the region surrounding the resort town of El Arish.²² The green marine turtle (*Chelonia mydas*) is also cited near Port Said and the coasts of the Nile delta.²³

The populations of *Caretta caretta* and *Chelonia mydas* are currently small and under intense pressure from human activities in the area. Capture of adult turtles, human predation of eggs and rapid beach development threaten to eradicate this population in the near future. As the status of nesting populations in the area is fragile the immediate implementation of basic conservation measures such as public education programs, protection of nests from predators and translocation of vulnerable eggs, is deemed essential. No evidence of nesting was found in the Nile Delta region, however large numbers of dead turtles were found washed ashore, suggesting that marine turtles congregate in the near shore waters to feed on continental shelf sea grass beds. Limited circumstantial evidence of nesting was found in the eastern region between Alexandria and the Libyan border, where nesting activity in this area was negligible.²⁴

Crocodylus sp.

Crocodiles occupy rivers, lakes, wetlands, and sometimes brackish water. Crocodiles of genus *Crocodylus* are freshwater organisms.²⁵ They were fairly common in the Nile and Delta. They do not currently inhabit Lower Egypt today because of human pressure.²⁶

Hunting

Ancient Egyptians were literally surrounded by animals, both domestic and wild. Herodotus suggested that Egyptians were unique in that they kept animals in their houses.²⁷ This contrasts with the Greek, Roman, Jewish, and Christian cultures, all of which placed *Homo sapiens* on a pedestal as dominant over the rest of Creation, ancient

Egyptians saw themselves as creatures of Nature along with animals and plants.²⁸

To the best of our knowledge, there is no picture extant depicting the hunt for crocodiles by ancient Egyptians. Several ancient tomb scenes show a crocodile grabbing a baby hippopotamus as it emerged from its mother during birth and another depicted crocodiles mating. Also, there are images of immobile crocodiles in the water while men are occupied fishing and hunting in mastabas.²⁹ Actually, they were shown in the midst of shoals of fish which was their main food. In contrast, the hunt for hippo is clearly shown in reliefs in the tomb of Mereruka at Saqqara (beginning of the Sixth Dynasty) and Antef at Thebes (Eighteenth Dynasty).³⁰ Hunters on boats used ropes and spears with metal points.

The only descriptions of crocodile hunting from Pharaonic times are those of Herodotus (484-425 BC) and Diodorus Siculus (First Century BC) during a very late period.³¹ According to Herodotus (Histories 2,70), “there are many ways to hunt crocodiles; I shall describe the way I think is most worth mentioning. The hunter baits a hook with a pig’s back, and lets it float in the river. He remains on the bank with a live piglet and beats it. The crocodile hears the squeals of the pig, follows the sound, and finds the bait, which it swallows; then the hunter hauls in the line. When the crocodile is ashore, he covers its eyes with mud; then the quarry is very easily overcome, but without that it would be very difficult”³²

Diodorus Siculus (First Century BC) thought that crocodiles were plentiful because they were rarely hunted. He also mentioned that “In early times the Egyptians used to catch these beasts with hooks baited with the flesh of pigs, but then they hunted them sometimes with heavy nets, such as those used to catch some types of fish, and sometimes from their boats with iron spears which they stabbed repeatedly into the crocodiles’ heads”³³

Diodorus Siculus thought that crocodiles were not edible but Herodotus mentioned that they were actually eaten in some parts of Egypt such as Elephantine.³⁴

Consequently, the techniques used for capturing crocodiles included, at the very least, hooks, nets and spears. It is important to point out that crocodiles were a permanent menace, as is mentioned in the traditional Instructions of Dua-Khety where the author considers fishermen to be more miserable than any man of any other profession, mostly because their low-lying boats and rafts could be overturned by hippos and crocodiles, and they might be killed by them.³⁵

19. Pritchard 1979.

20. Marx 1968; Sella 1982 fide Delaquerre 1987.

21. Loveridge, Williams 1957.

22. See also Sella 1980, 1982 fide Delaquerre 1987; Dodd 1990.

23. Loveridge, Williams 1957; Sella 1982 fide Delaquerre 1987.

24. Clarke et al. 2000.

25. Britton 2013.

26. Britton 2013.

27. Strouhal 2005.

28. Strouhal 2005.

29. Tomb of Mereruka, Saqqara and Tomb of Zau, Deir el Gebrāwi; both tombs date to the Old Kingdom; Brewer, Friedman 1989.

30. Osborn, Osbornová 1998.

31. Anonymous 2013; Tayer 2013.

32. Anonymous 2013.

33. Tayer 2013.

34. Anonymous 2013.

35. Strouhal 2005.

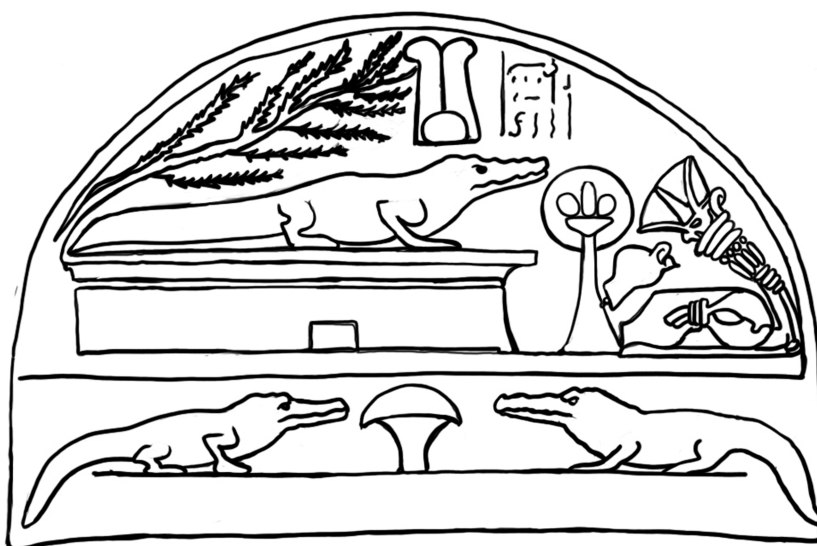


Figure 2. Stela showing what is most likely a statue of Sobek or Sobek-Re, a crocodile god associated with the Nile and its annual flood wearing a crown consisting of two plumes and a sun disk. The god surmounts a shrine under a tree, perhaps also an object of veneration. The crocodiles shown below are probably representations of the animals kept in the temple precinct, which were seen as manifestations of the *bau*, or powers, of the god. However, it is also possible that they represent successive regenerations of the god. Dahamsha, Egypt, ca. 1295-1070 B.C., Nineteenth-Twentieth Dynasties, Brooklyn Museum, Charles Edwin Wilbour Fund, 7.174. Modified from http://www.brooklynmuseum.org/opencollection/objects/3763/Stela_Fragment_with_Crocodiles/image/73709/West_Wing_gallery_A-2_installation/right_tab/related/

It may be difficult to define collecting turtles as hunting, because they were gathered for their shells and their meat. Unfortunately, although there are depictions and palettes with the contour of turtles, there is no representation of them being collected. In the present day Nile, aquatic turtles are mainly captured with nets.³⁶

Water volumes varied substantially throughout the year depending on the season. Aquatic reptiles were not trapped in residual pools since they could easily migrate over land.³⁷ However, being carnivorous the *Tryonix* and the *Crocodylus* could have been attracted by the concentration of fish in such pools during the dry season, and this habit would have certainly made them vulnerable to human predation; however, this did not happen because they would have interfered with human fish harvesting, the main source of food for the inhabitants of Tell el-Ghaba.

Cult

Fish was the most important source of protein in Tell el-Ghaba.³⁸ Crocodiles were probably used as food; however, the deification and the cult of these reptiles belong to the religious phenomenon of the ancient Egyptian animal cult.³⁹

Turtles were used as food or, less commonly, as artifacts, such as the containers and combs found in several places

of ancient Egypt.⁴⁰ At some sites, like HK29A that dates from the Nagada IIB-C period (ca. 3400 BC), the high proportion of game, including many crocodile remains, can be connected with rituals or religion.⁴¹ The cult of Sobek, the Crocodile God at Fayum, was widely spread during the Middle Kingdom under the Twelfth Dynasty, and the Ptolemaic period.⁴² King Amenemhet III was associated with Sobek during his reign and was deified. His deification is the result of his agricultural development in Lake Moeris that gained new territories in Fayum. During the Ptolemaic kings his cult as a deified king was recovered and again the cult of Sobek was restored. Actually, Herodotus observed that in some places crocodiles were considered holy and in others abhorred and hunted (Figure 3).⁴³ Yet, there is no evidence in the site that either turtles nor crocodiles might have had some cultic function, or that they might have been dedicated to the god of the locality.⁴⁴

Conclusions

This is the first description of *Crocodylus* and freshwater turtles in the Sinai Peninsula. Their occurrence is related to the presence of the ancient Pelusiatic branch, traced on the easternmost part of the Nile delta. Freshwater turtles occur in many environments in the Nile valley and delta today and crocodiles, before the presence of modern man, were

36. Peters 1995.

37. Peters 1995.

38. Cione 2006a.

39. Bresciani 2005.

40. Germond, Livet 2001.

41. Linseele, Van Neer 2005.

42. Lupo de Ferriol 1997.

43. Anonymous 2013.

44. See Ikram, 2005.

wide-ranging in these areas. The species *Trionyx triunguis* and crocodiles have been frequently cited in many archaeological sites in Africa.⁴⁵ However, today the Sinai is a vast desert land with no rivers or permanent lakes.

Tell el-Ghaba is the sole Egyptian site with a relatively high number of marine vertebrates, mostly fishes.⁴⁶ Besides the Nilotic species, there is evidence of the largest and most diverse marine fish fauna in a Pharaonic site (NISP: 6.55%, including *Mugil* sp.), which is certainly related to the proximity to the Mediterranean Sea. This is the only Pharaonic site where marine selachians, such as *Carcharhinus obscurus*, *Sphyrna lewini*, *Carcharias taurus* (the first shark tooth from a Pharaonic site) and batoids (along with a marine turtle), are recorded.⁴⁷ Here we also report the first record of marine turtles in a dynastic site in Egypt.⁴⁸ Marine turtles are common in the Mediterranean coast of Egypt. According to the archaeological evidence, tomb art, and written records, Egyptians in dynastic times did not capture marine animals. The settlement proved to be the only Pharaonic site with a relatively high diversity of marine fishes and some turtles. The rare occurrence or absence of marine vertebrates from most dynastic time sites appears to be caused by the lack of adequate coastal areas for habitation and the abundance of continental fishes in the Nile. This situation began to change in the Hellenistic and Roman times, when several settlements were established in the Mediterranean and Red Sea coasts.

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45. e.g. Peters 1995; Lapparent de Broin 2000.

46. Cione, 2006a.

47. Cione 2006a.

48. See Frazier 2003.