



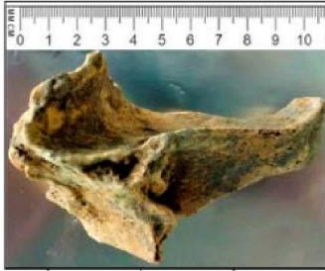
An AI generated image of a pigmy hippo

The legacy of an extinct pygmy hippo from Cyprus

By Nikolaos Psonis

“Once upon a time...

.....There was a pygmy hippo named *Phanourios* living in the island of Cyprus. That was a long time ago, towards the end of the Pleistocene, almost 12,500 years ago. Cyprus back then was quite different, more humid, hotter and with different vegetation. *Phanourios* was the last of its kind and when he grew old and died, the species went extinct. Thus, nobody had identified his relatives, until recently.



Last year, a scientist from Crete managed to retrieve DNA from the fossil bones of *Phanourios* and study it. That was a really difficult task, because DNA had been badly preserved since the Pleistocene.

But imagine what... He found out that the most closely related species to the extinct small-sized Cypriot hippo is the extant large-sized common hippopotamus, living peacefully nowadays in Africa”.

The pigmy hippopotamus of Cyprus (*Hippopotamus minor*) is an extinct endemic species that lived in the island of Cyprus from Middle (770,000 to 126,000 years ago) to Upper (129,000 to 11,700 years ago) Pleistocene. It is considered one of the smallest hippos in the world. Based on morphological analysis (bone measurements) it is considered to be more closely related to the large sized common hippo (*Hippopotamus amphibius*) rather than to the contemporary pigmy hippo of West Africa (*Choeropsis liberiensis*).

Cutting edge genomic methods like the analysis of ancient DNA from fossil bones of Pleistocene mammals could shed light into the evolution and biogeography and solve phylogenetic relationships of extinct species. However, the climate conditions in Cyprus do not favour the maintenance of genetic material as fossil bones.



The postdoctoral fellow Nikolaos Psonis and his colleagues in the Ancient DNA Lab at FORTH-IMBB with Nikos Poulakakis on the lead, are specialized in finding, extracting and analyzing genetic material from fossil bones. Since its inauguration in 2016, the Ancient DNA Lab has been involved in numerous projects for deciphering the evolutionary history especially in human archaeology, animal archaeology and paleontology of eastern Mediterranean basin.

With special lab protocols, Dr Psonis and his colleagues managed to trap and read part of the mitochondrial DNA from the badly preserved bones of the pigmy hippo found in Cyprus.

The results confirmed the hypothesis that the Cypriot hippo evolved from a larger ancestor and that his size was gradually reduced within a few hundred thousand generations, following the “island rule”. In remote islands, larger animals evolve to smaller forms (island dwarfism) and smaller animals to larger (island gigantism), due to the absence of important predators and adverse conditions (climate, limited food accessibility).

They also found that the pigmy hippo diverged from the common hippo about 1,5 million years ago. That period was characterized by the alternation of hot and cold periods (ice ages). During cold periods, the ice would spread and the sea levels would fall. In one of these ice periods where the sea levels were lower, the big hippos crossed the mainland to Cyprus through intermediate shallow areas and smaller islands and were isolated there later on.



There is a local legend in Cyprus. Locals finding semi fossil bones thought that they belonged to several saints with the most prominent being Agios Phanourios. Thus, the pigmy hippo is also known as “*Phanourios minor*” amongst paleontologists.