The sediments of Glyphada cave at Diros Laconia and their contribution to the study of the paleoenvironment b.

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Greece is considered as a country with a relatively large number of caves. **2** More than ten thousand caves have been recorded and this number increases, as new caves are continually discovered.

**3** The cave of Glyphada is situated at Laconia district, in the peninsula of Mani, the southern edge of European continent. Its placement was very significant at the past, especially during the glacial period, when animal and consequently human movements towards the south were evidenced, looking for areas with milder climate.

The first exploration of the cave took place at 1949, by the geologist Ioannis Petrohilos and his wife Anna. The touristic development has been realized at 1961. Since 1987, the Department of Paleoanthropology-Speleology of the Greek Ministry of Culture, in collaboration with an international team of speleodivers (Jan Jack Bolanz, Patrick Deriaz, Luigi Casati) undertakes the systematic survey and mapping of the terrestrial and underwater parts of the cave,**4** along with the study of its environment. Since then, galleries of 14.750 m. total length have been explored and mapped, a large part of them being under the water, which had flooded the cave in past times.**5**

The cave is developed into crystalline limestones of the Kriti-Mani or “Plattenkalk” zone (Thiebault, 1977) **6**. Its morphology is the typical one of the caves created on the surface of the aquiferous horizon, affected both by the direction of the regional faults and generally the tectonic phenomena and by the eustatic sea level changes. The today’s morphology is in many parts labyrinthine, due to the rich stalagmite decoration.**7,8,9,10,11**

In the frame of the ongoing study, measurements of temperature **12**, humidity **13**, CO2 ,**14** O2 and CO have been taken. The research has not been limited to the cave atmosphere but also included the study of the chemical, clastic and organic sediments. Petrographic analyses, water analyses from different sites and depths, measurements of the growth of the stalactites and stalagmites are main axes of the work undertaken.

An outstanding finding is the large number of animal bones **15 ,** being brought to light during speleo-diving as a special subject of research **16**. In their majority they belong to hippopotamus, an adjacent to *hippopotamus amphibious* species, although, according to measurements, a new species cannot be excluded. Until now more than 200 integral bones have been revealed and about 600 large fragments, while new areas have been located inside the cave. Because of the large number of bones the site can be considered as the most important site in the Greek region. The dating of the stalactite material which has covered the bones, undertaken at the Isotope Centre of the University of Gröningen, gave 31.650± 550 B.C. The dating of the bones has not been successful, because of the lack of collagen.

Apart from the hippopotamus bones, other bones belonging to hyena, panther, lions, deer, seal, rodents and fowls have been revealed.**17, 18, 19, 20, 21, 22, 23**

Stalactite decoration has been found all over the underwater part of the cave, until the depth of 70 m. This decoration is relatively new, having been dated at 18.000 B.P.

One of the most significant remarks is the existence of a thin black layer on the surface of the decoration located under the depth of 50 cm. and on the bones found underwater **24, 25, 26**. The microanalysis of a stalactite specimen from the depth of 8 m. indicated calcite as main ingredient along with traces of manganese-calcite. On the contrary, the black layer proved to be consisted from amorphous manganese oxides, containing a small quantity of iron.**27, 28**

During another research undertaken in the environment of an underwater cave in Crete **29**, “ the elephants cave”, a similar manganese layer have been found on the stalactite decoration and on the paleontological material, which lies under the water.**30, 31**

The preliminary study leads to the suggestion of a huge underwater volcanic eruption and to the consequent “pollution” with the manganese oxides.

The ongoing study aims to the following:

* **32** Research on the aetiology of the presence of the paleontological material inside Glyphada cave.
* Research on the aetiology of the presence of manganese layer on all surfaces been located underwater. **33**
* Precise dating of the deposition of manganese layer and evaluation of the expansion of the phenomenon.