



Lake Lerna: investigating Hercules' ancient myth

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Can mythology provide information on the timing of the human influence on environments?

Hercules is one of the most emblematic figures of Greek mythology, with his 12 works being amongst the most well-known worldwide. We investigate here the myth of **Hercules and the Lernaean Hydra**, which is believed to be based on natural phenomena.

BASIS OF THE MYTH: efforts of local populations to dry marshlands to avoid spreading of diseases, use the land for agriculture.

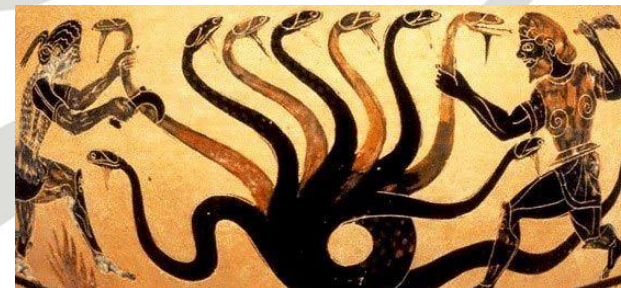
Myth	Geology
The hydra had many heads	Many sinkholes/springs part of a karstic system
Hercules cut them off one by one	Closing them caused the water to find another way out
Twice as many heads grew back	Locals burnt down the vegetation and located the sinkholes
Hercules cut the heads and burnt them	Re-routing of water & desiccation of areas

How and when did the people of Lerna interact with their environment?

What conditions prevailed before human impact on the area?



Conservation Palaeobiology approach



Material & Methods

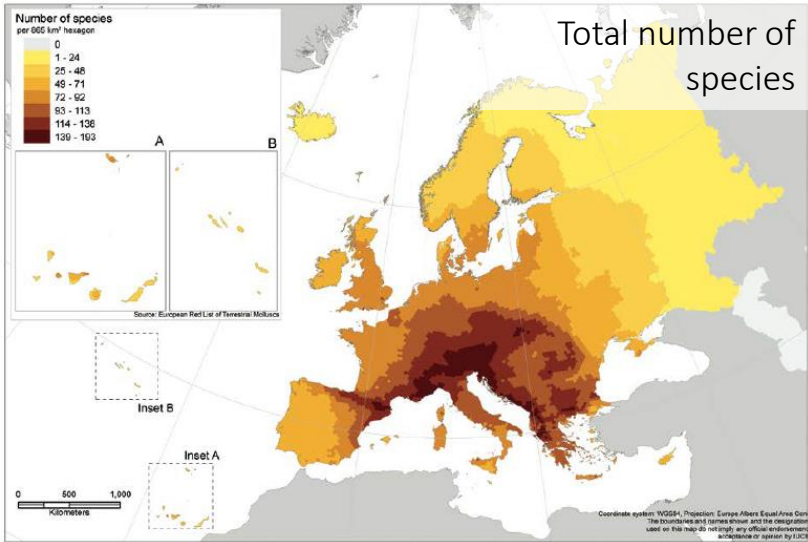
- One core (4 m) from the area of the ancient lake.
- Sedimentological analysis.
- Palaeontological study of samples spaced at 10 cm.
- Palaeontological material consists of molluscs (gastropods and bivalves).
- Data analysis of molluscs: variation of composition of each sample throughout the core.
- Radiocarbon dating of levels of peat and organic-rich levels at key parts of the core.



The study area, around the village of Lerna, belongs to a large karstic system in the east of the Peloponnese. It was isolated from the open sea at about 7000 years bp.

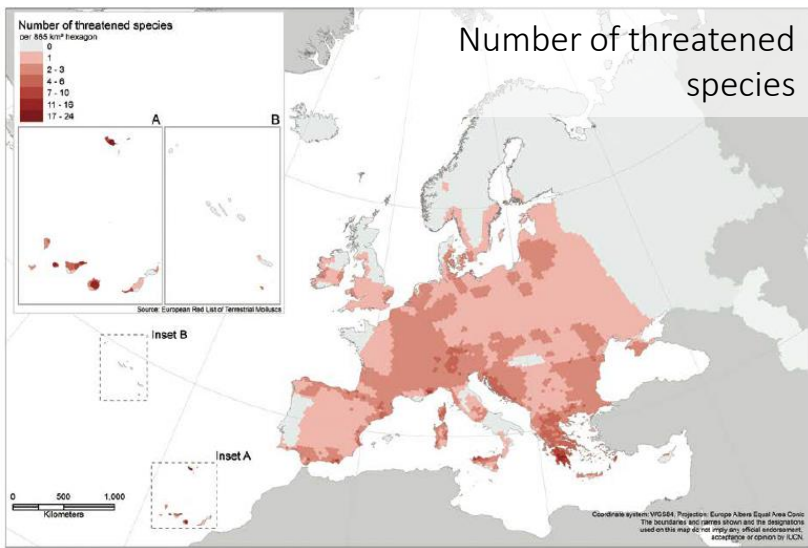
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Current state of terrestrial gastropods and coastal environments.

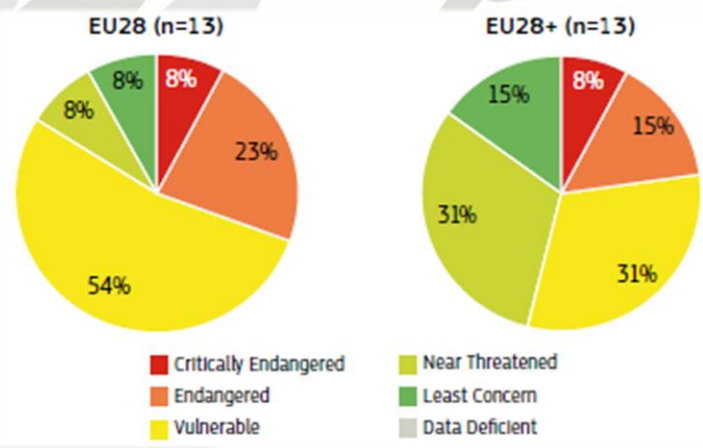


→ Greece has the highest diversity in terrestrial molluscs, 58% of terrestrial gastropods are endemic according to Vardinogianni et al. (2018).

→ The Peloponnese has a very high number of threatened species.



Coastal environments are amongst the most threatened. More than half of the mire and bog habitats of the EU are classified as vulnerable, endangered and critically endangered.



Source: European red list of terrestrial molluscs

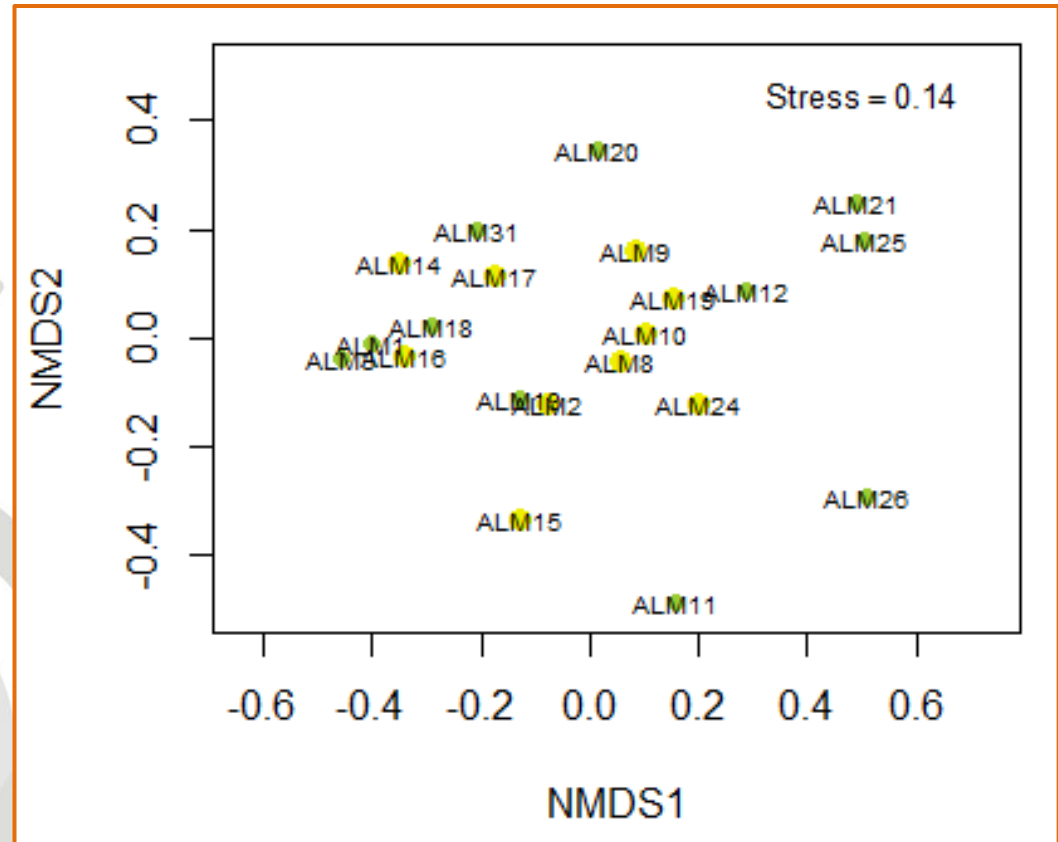
Results

- 549 shells recovered.
- 13 species of gastropods – one species of bivalve. Most of them are endemic of SE Europe (Greece, Turkey).
- Variation of environments between dominance of terrestrial and freshwater species.
- Lower part of the core poor in molluscs.
- Sediments are not reworked and fine-grained.

Dating

Top part of the core: 3200 years bp.

→ It coincides with the birth of the myth of Hercules and the Lernaean Hydra.



NMDS plot for the visualisation of the data. Yellow points correspond to lacustrine conditions (presence of bivalves).

Influence of the killing of the Lernaean Hydra myth or reality?

Conclusions

- Diverse, well-established terrestrial-lacustrine gastropod populations were present.
- Sedimentology shows lacustrine conditions with no fluvial influence.
- Drying event confirmed during the estimated time of the creation of the myth of Hercules and the Lernaean Hydra.
- Finding a baseline is tricky in the area, there has been a human presence since at least the late Neolithic.
- Variation of dryer and wetter conditions can reflect the drying efforts of locals to dry the area.

REFERENCES

Janssen J.A.M. et al., 2016. European Red List of Habitats. Part 2. Terrestrial and freshwater habitats.
https://ec.europa.eu/environment/nature/knowledge/pdf/terrestrial_EU_red_list_report.pdf

Vardinogianni et al. 2018. Land molluscs in Greece: The rich, unique, diverse and unprotected animal models *in* Pafilis P., Parmakelis A., Poulakakis N., Sfenthourakis S., Triantis K. (Eds), Biogeography and Biodiversity of the Aegean. In honour of Prof. Moysis Mylonas. Broken Hill Publishers Ltd. ISBN: 9789925563784

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HELLENIC REPUBLIC

**National and Kapodistrian
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EST. 1837



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