Diet and metal pollution in neonatal remains from Roman A Lanzada, Spain

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PollutedPast
Environmental metal pollution revealed in archaeological human remains

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Introduction

A Lanzada is a coastal archaeological site containing two funerary areas, a Roman and post-Roman necropolis (Figure 1). This research aimed to contextualise the 1st Century Roman infants found within housing settlements by investigating elemental levels to gain a broader insight to their pollution exposure and dietary behaviours. The objective was to gain insight to health of pregnant mothers and babies within a pollution context.

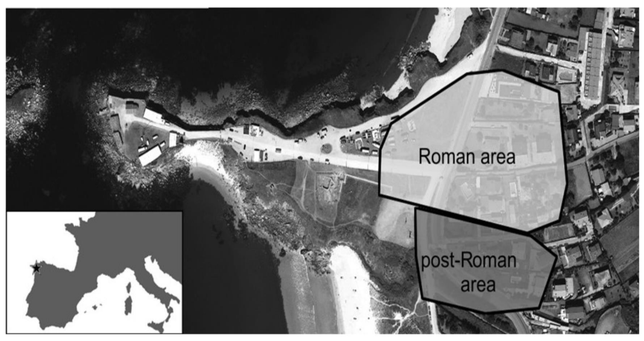
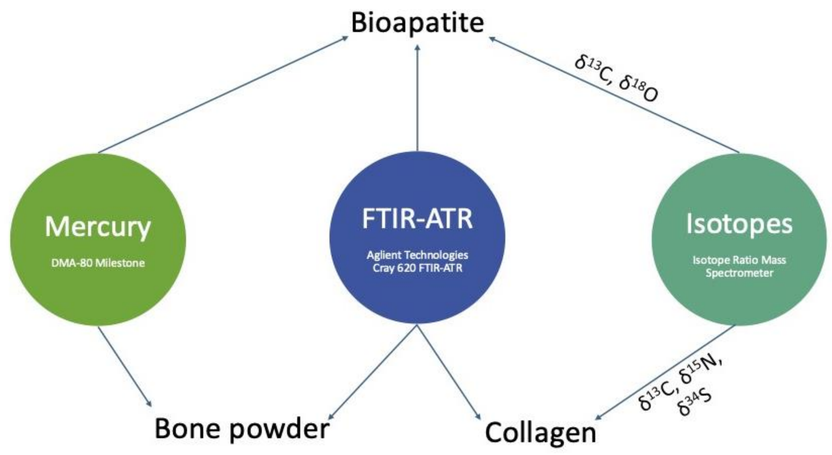


Figure 1- Map and aerial view of A Lanzada, identifying the Roman and Post-Roman necropolises (Lopez-Costas 2015)

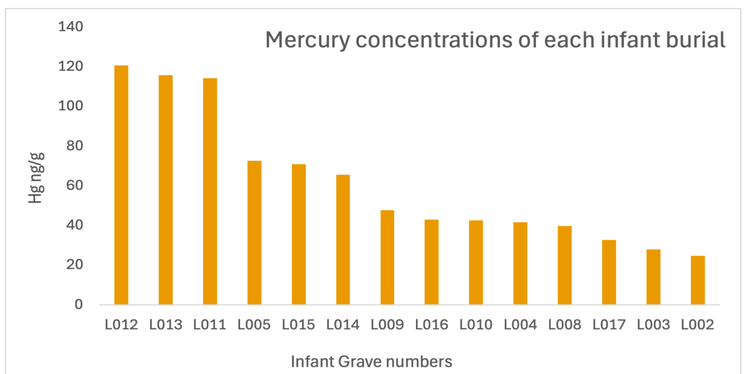
Figure 2- A Lanzada L013 on site

Methods

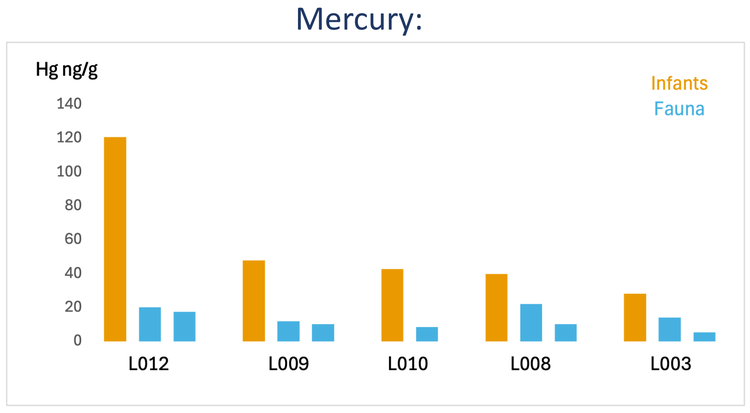


Sample size:
Neonates-15
Terrestrial fauna- 15

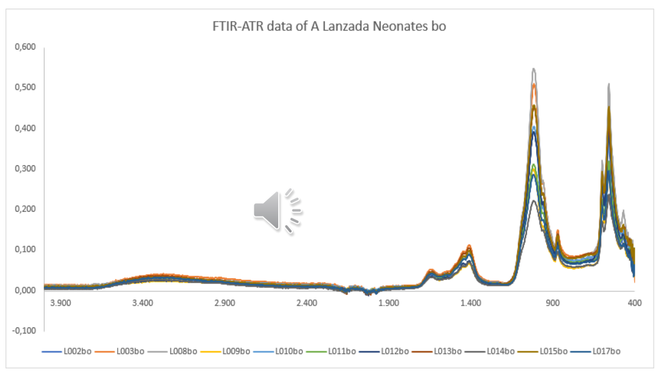
Results



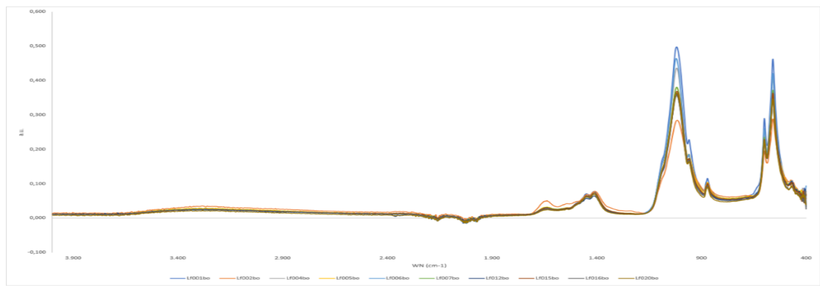
Mercury:



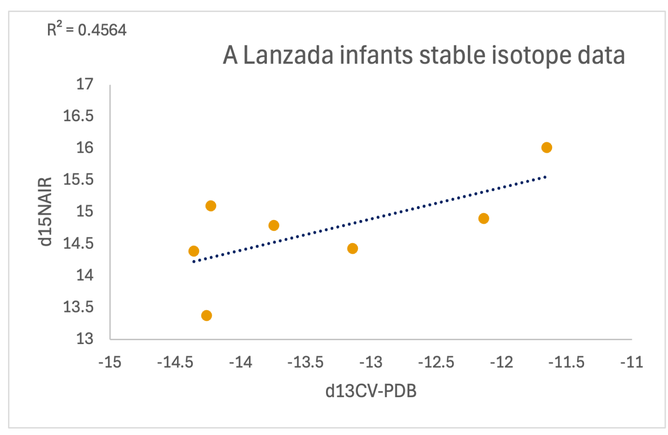
FTIR-ATR:



Characteristic pattern of absorbances of bioapatite and collagen, indicating good preservation unaffected by diagenetic processes



Isotopes:

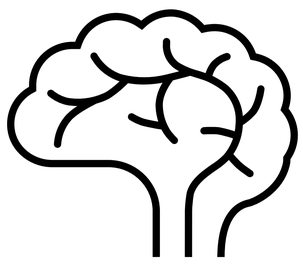


R=0.68

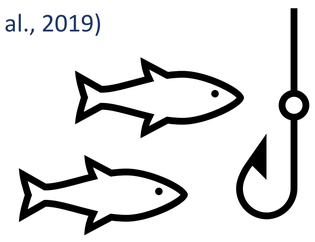
Discussion: Human data

Mercury data:

- Data revealed low pollution exposure, although levels are higher than the adults (Álvarez-Fernández et al., 2022), possibly relating to tissue remodelling during pregnancy
- Hg exposure during foetal development has physical and neurological developmental impacts (Dack et al. 2022)



- Elevated nitrogen values matched those of a coastal site and displayed effects of breast milk influence.
- High C_4 intake, links to how millet was commonly given to pregnant women in addition to being used as a substitute when C_3 availability was low (Inskip et al., 2019)
- Regarding mobility, most pregnant women remained local to A Lanzada



Conclusions

- Dietary reconstruction revealed high C_4 protein influence within the mother's diet through a positive carbon and nitrogen correlation.
- The absence of neonatal data within the archaeological record limits researching this vulnerable group; small samples sizes, due to diagenesis, result in reduced the survival rates of neonatal remains.
- Investigating further would incorporate other Iberian neonatal remains for health and pollution comparisons and investigate why babies had higher mercury levels than the adults.

References

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