Comparison of deciduous molars across genus *Homo* in Europe: how a large modern sample changes the story.

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INTRODUCTION

Deciduous teeth provide valuable information for paleoanthropological studies. Because of their importance to the survival of young children, their variation in size and shape may be especially informative for human evolution [1,2]. However…**how can sample size bias our understanding of deciduous teeth in human evolution?**

To address this question, we compared the large *H. sapiens* modern sample from the *Ratón Pérez* collection [3] to a wide range of hominin taxa from the published scientific literature. Additionally, we also test the hypothesis that some deciduous molars are more taxonomically informative than others.
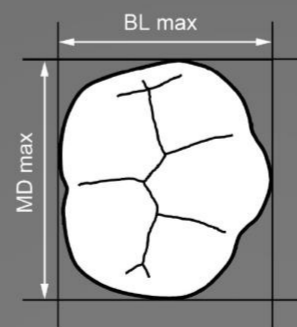
MATERIALS

A total of **317** deciduous molars.

SPECIMEN	dm^1	dm^2	dm$_1$	dm$_2$
H. antecessor	1	1	2	1
Middle Pleistocene *Homo*	3	8	5	5
Sima de los Huesos (SH)	0	2	0	2
H. neanderthalensis (NEA)	4	7	8	28
H. sapiens fossil (SAP)	0	0	0	8
H. sapiens modern (RP)	58	58	62	54

METHODS

We compared the **linear dimensions** of all the deciduous molars:

- Mesiodistal (MD) diameter
- Buccolingual (BL) diameter
- Crown Index (BL/MDx100)

Want more information about my amazing collection? Scan the **QR code** below!
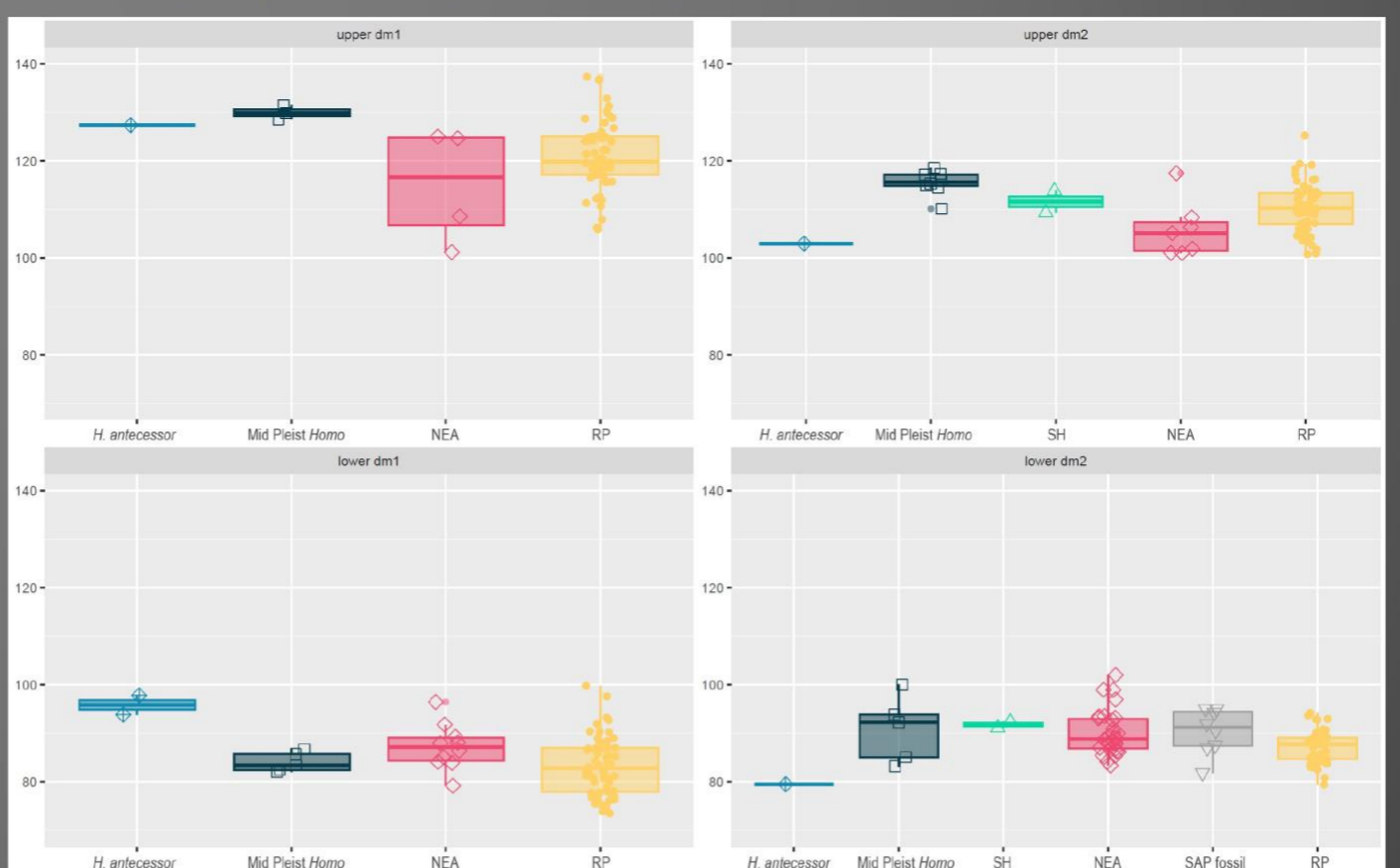
RESULTS

In the plots below notice how the variation captured by the relatively much larger modern human sample (in yellow) compares to that of the much smaller fossil samples.

Mesiodistal (MD) and buccolingual (BL) diameters.
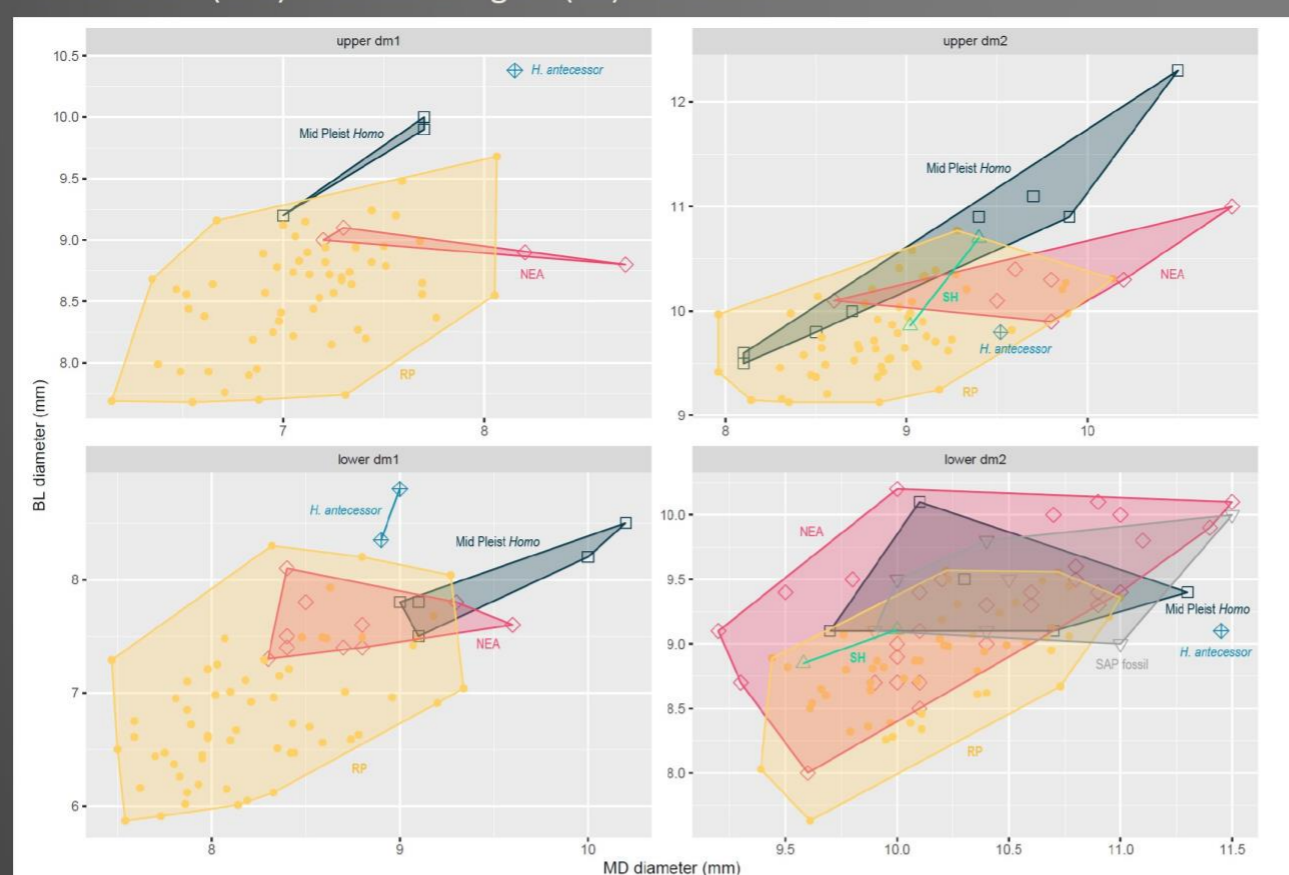
Crown index (CI) of the *Homo* deciduous molars.

CONCLUSIONS

In modern humans, **deciduous second molars show less taxonomic separation than first molars.** Since first deciduous molars develop and calcify earlier during gestation than second deciduous molars, this smaller variation in second deciduous molars may reflect the later timing of their development.

However, we find it notable that the **dispersion of the second deciduous molars in the modern human sample is less than what we observe for the first deciduous molar**. This lesser variation of the second deciduous molars may reflect the later timing of development. The first deciduous molars develop and calcify earlier during gestation than do the second deciduous molars.

Therefore, our study may primarily reveal the challenge of working with the small sample sizes available in the fossil record. **The patterns observed may be simply a reflection of sample size**, as the fossil samples for the first deciduous molars are much smaller than those for the second molars. This shows how important large comparative datasets are.

REFERENCES

[1] Bailey, S.E., 2017. Encyclopedia of Life Sciences. 1–7. [2] Bermúdez de Castro et al., 2017. Am. J. Phys. Anthropol. 163, 602–615. [3] Martínez de Pinillos et al., 2021. Am. J. Phys. Anthropol. 176, 528–535.