

#vEGU21

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The highest altitude paleoecological record of early pastoralism in Africa

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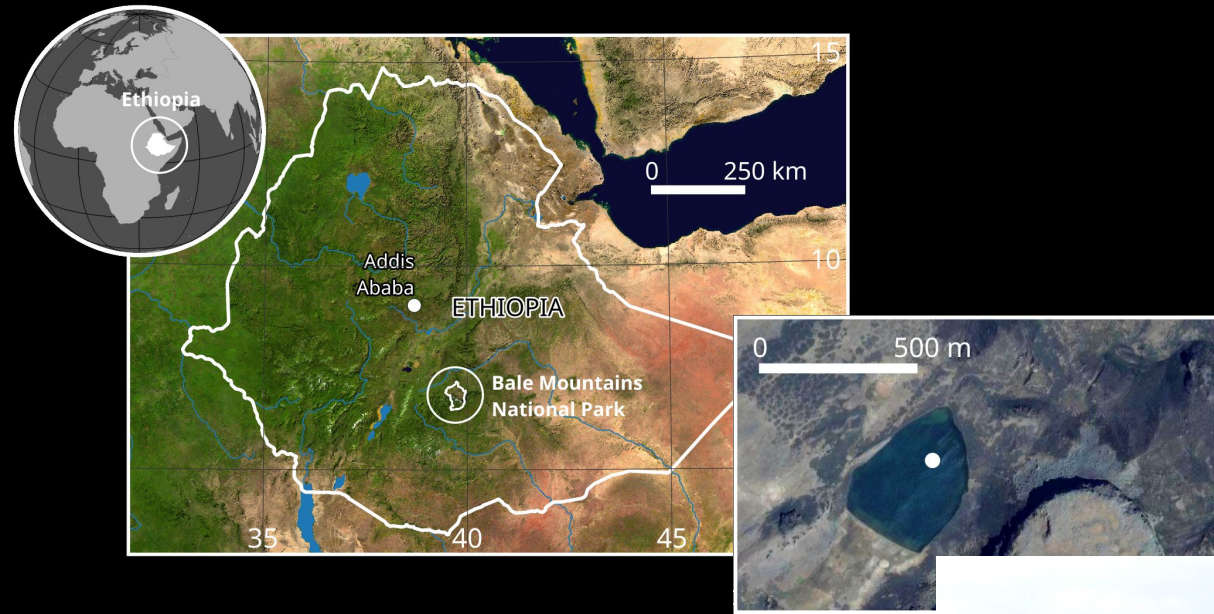
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The Garba Guracha record



3950 m asl in the
Afromontane-Afroalpine
ecosystem boundary

Photo: G. Gil-Romera, Feb 2017

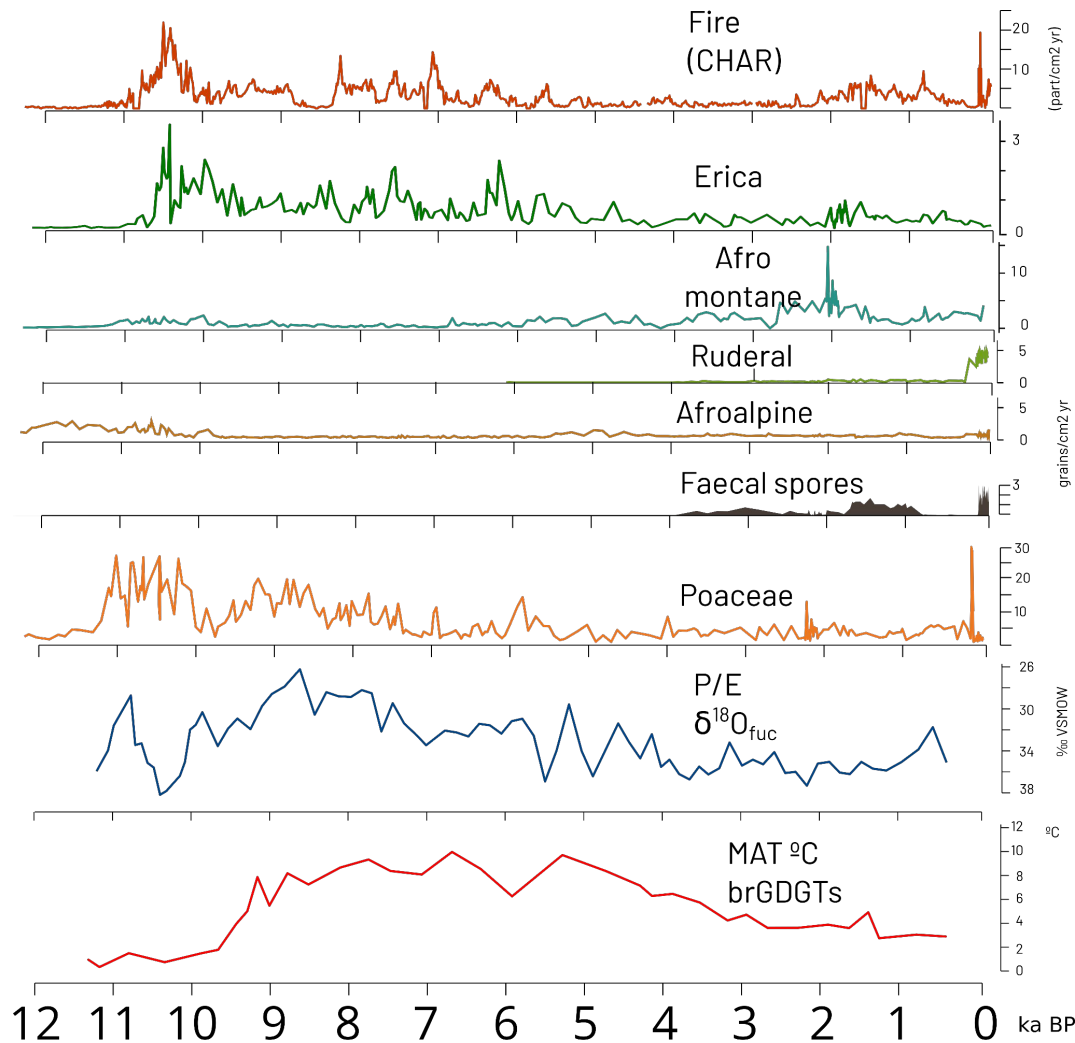




2 x 15 m cores

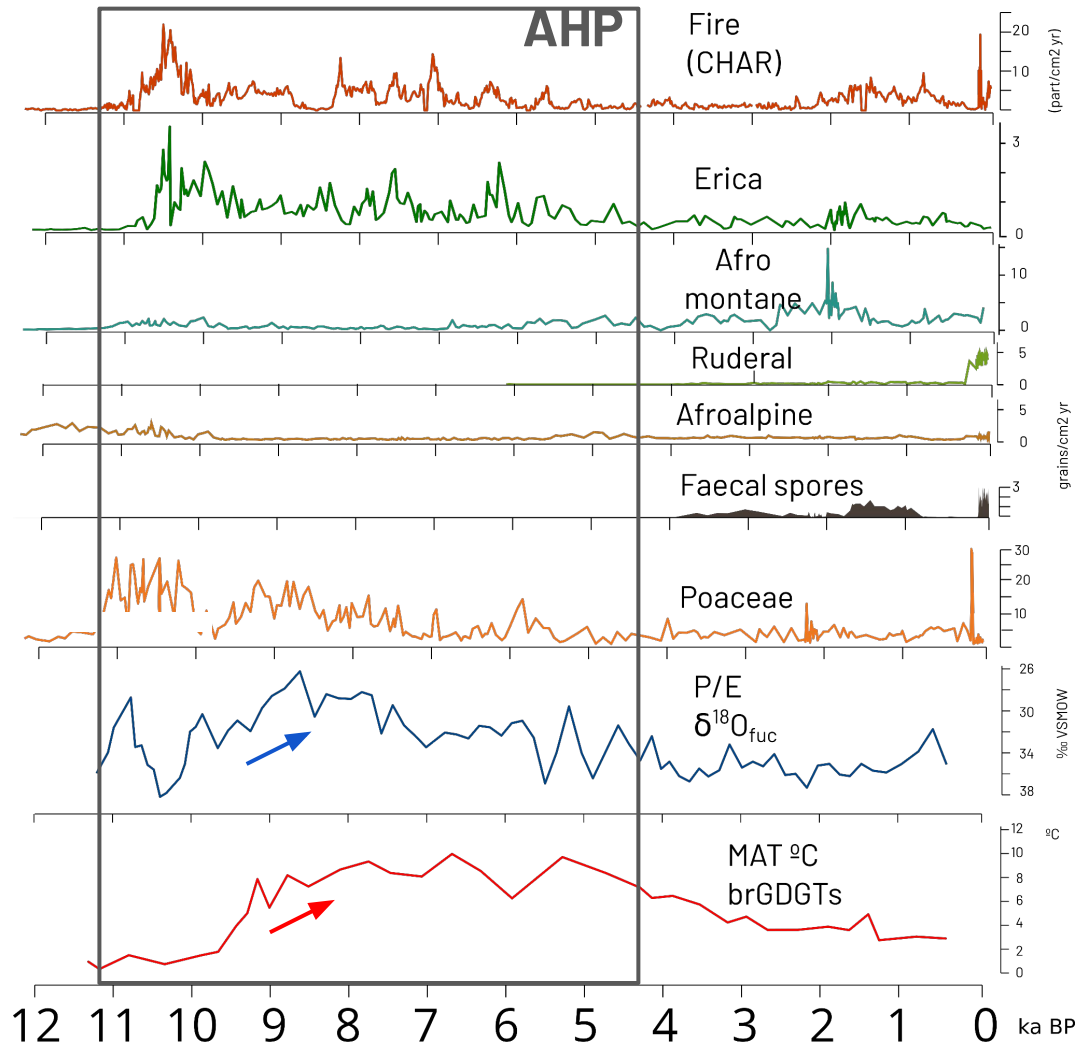
Multiproxy analyses: XRF, isotopes and biomarkers
(H, O y GDGTs), diatoms, pollen, charcoal, sedaDNA.

Photos: Graciela Gil-Romera y Janne Benesch



Some of the proxies in this presentation are unpublished, we kindly ask you to please do not use them without the author's consent.

- Age model and core description in [Bittner et al., 2020](#)
- Pollen, spores, charcoal in [Gil-Romera et al 2019](#), [Gil-Romera et al 2021](#).
- P/E from $\delta^{18}\text{O}_{\text{fuc}}$ in Bittner et al., 2021 (accepted)
- T from GDGTs in Bittner, De Jonge, Russell et al., unpub.
- sedaDNA in, Gil-Romera, Epp et al., unpub.



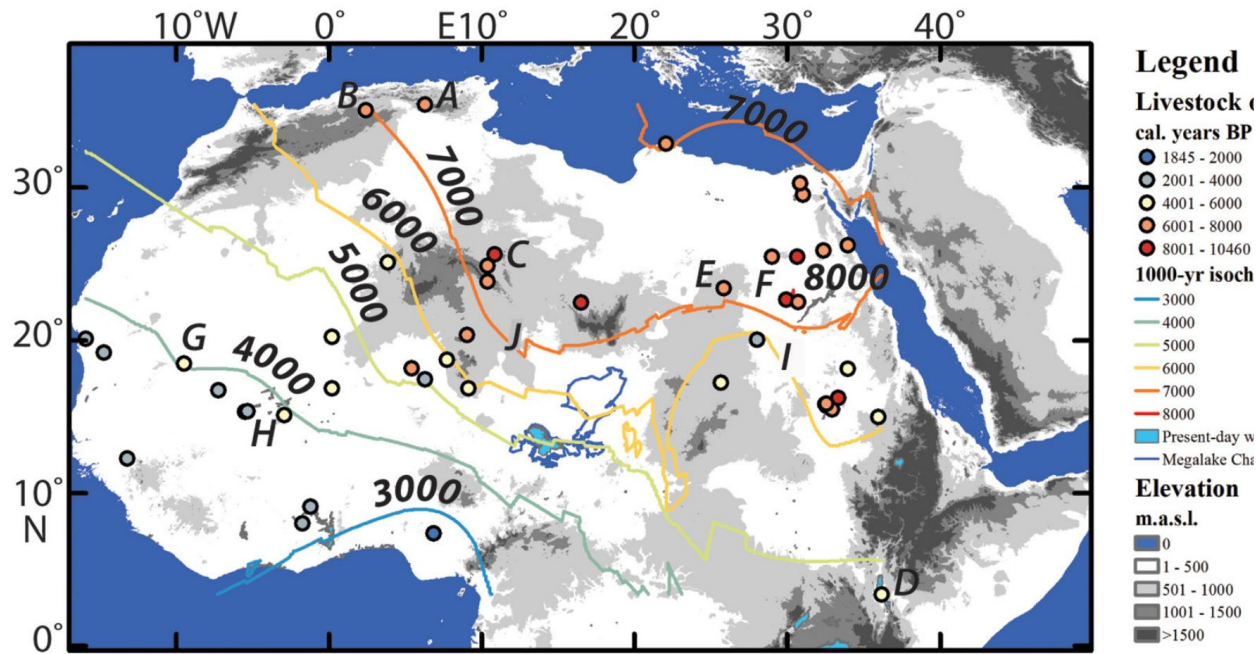
African Humid Period

Generally wetter and warmer environment in Garba Guracha between 10.5 and 6 ka BP



**Heathland expansion
& enhanced biomass
burning**

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Wright, D.K., 2017. Humans as Agents in the Termination of the African Humid Period. *Front. Earth Sci.* 5.

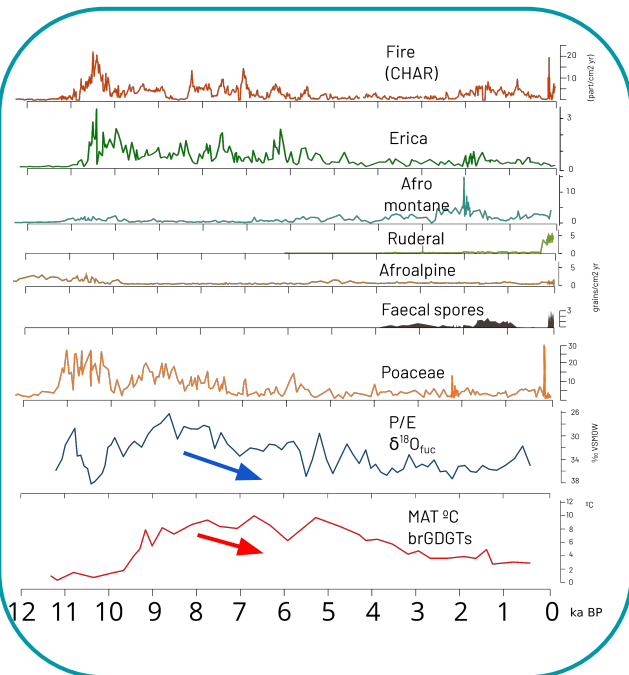
**African Humid Period
"Green Sahara"**

**Pastoralism
expansion from
the near East**

Hot topic: how the AHP termination prompted the pastoralism retraction into East and Southern Africa?

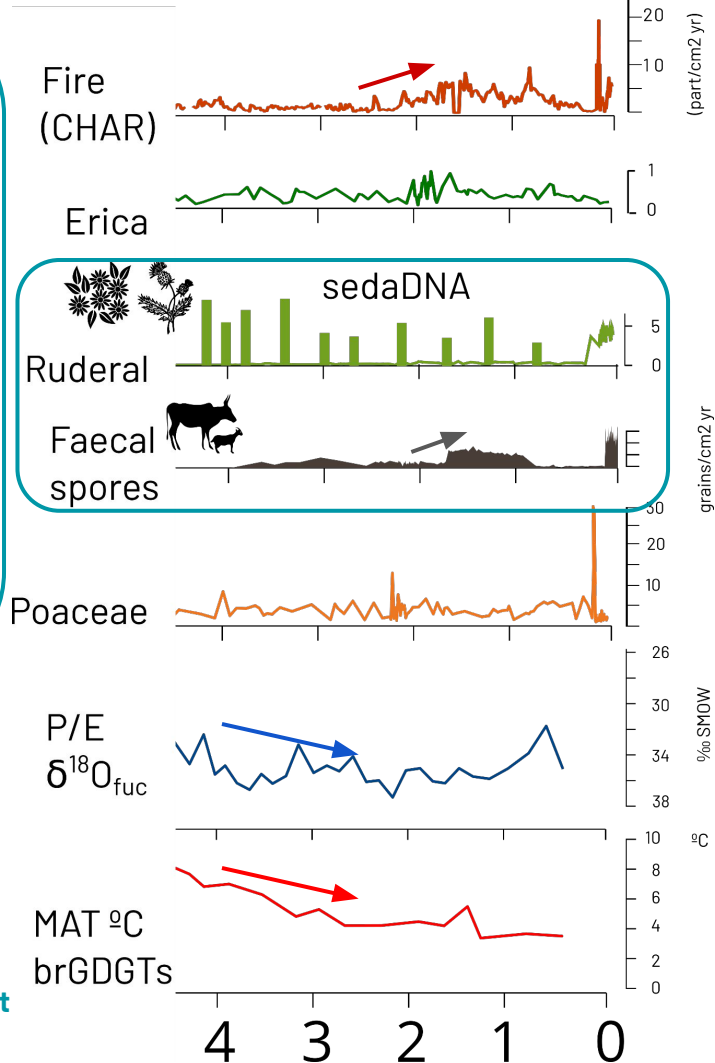


Can we trace pastoralism in high altitudes?



AHP termination & pastoralism onset

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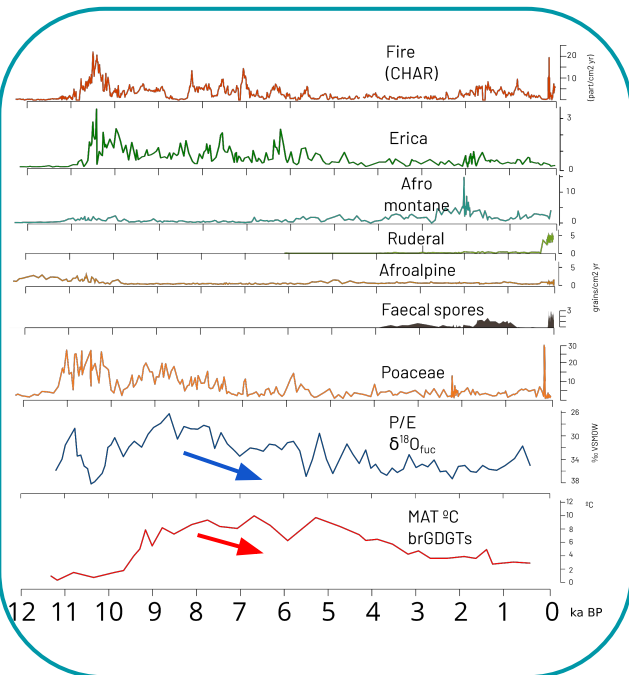
★ Progressive drying and cooling,

★ Clear indicators of pastoralism:

- faecal fungi spores at 3.8 ka BP
- expansion of ruderal plants (pollen and sedaDNA)

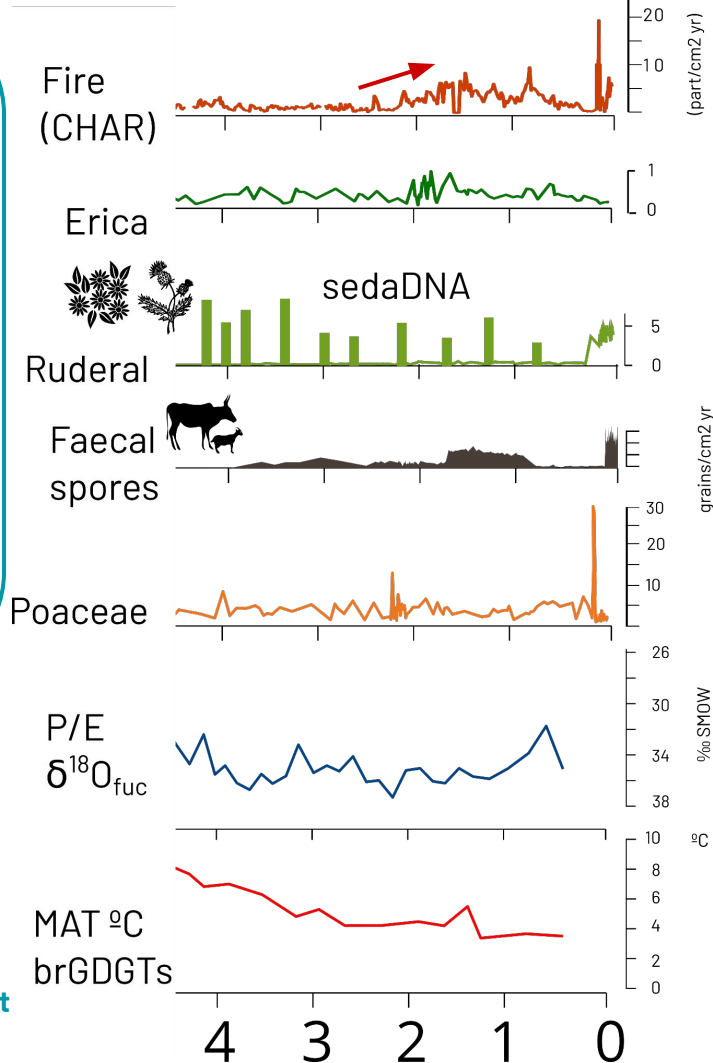
★ Need for pastures in a drying context.

★ Transition from hunter gatherers to pastoralists

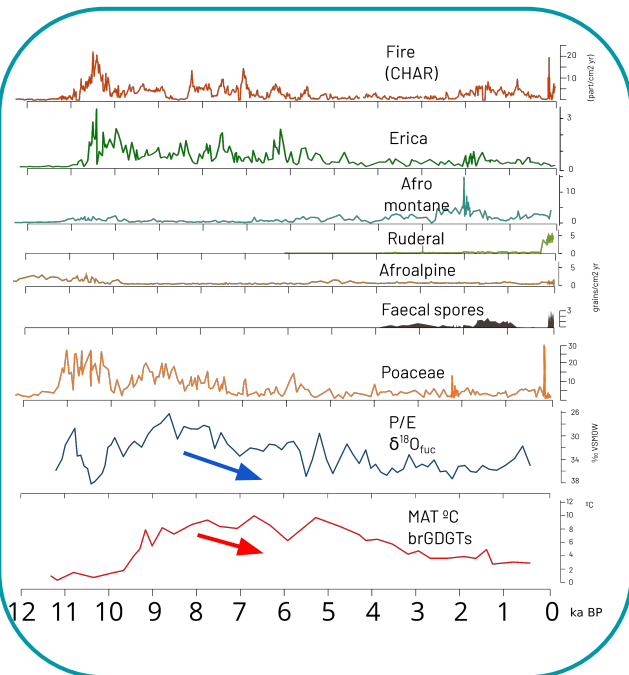


AHP termination & pastoralism onset

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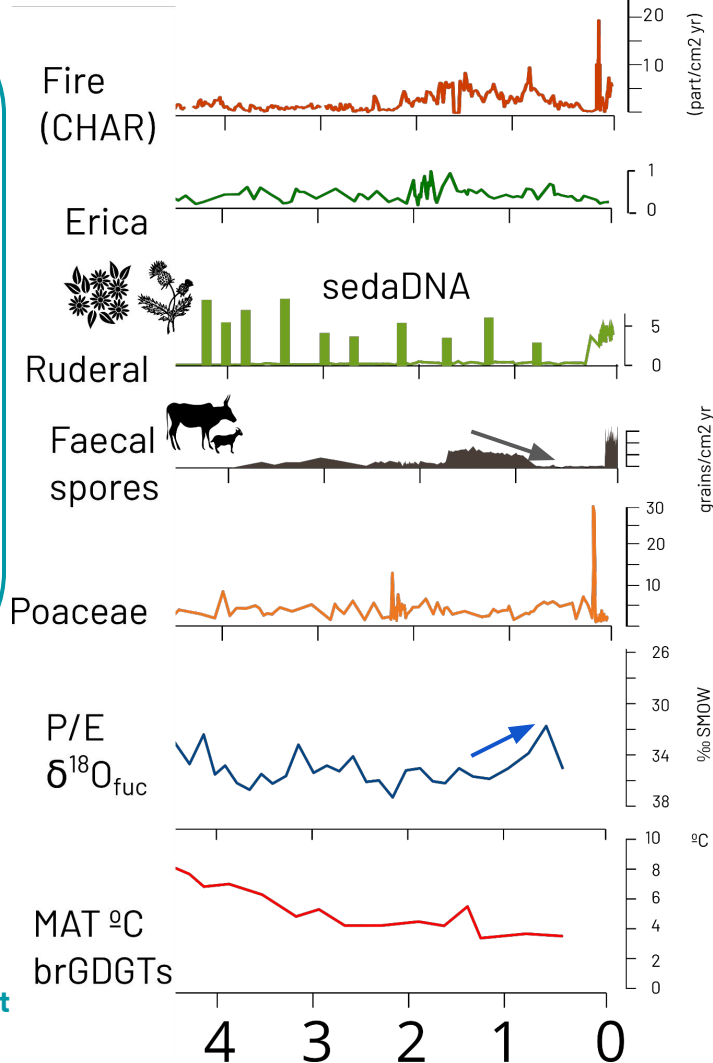


- ★ Increasing fire activity and faecal spores from 2.5 ka BP
- ★ Fire not connected to biomass abundance as in the early Holocene → **human-triggered.**
- ★ No trace of archeological remains in the area but found at lower altitudes. → **Seasonal use of resources**



AHP termination & pastoralism onset

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- ★ Pastoral activity at high altitudes might be **low altitude climate-dependant**.
- ★ Increasing rainfall over the last millenium implied an abandonment of the seasonal use of resources.
- ★ Important pastoral activity for the **last 200 years with strong biomass burning**.

Main ideas and impact of our research

- ★ **We found the highest altitude record of early pastoral activity in Africa (3950 masl, 3.8 ka BP)**
- ★ **The timing of pastoral activity at high altitudes in the southern Ethiopian highlands is coherent with the drying and cooling of the AHP termination.**
- ★ **Pastoral activity at these altitudes might be seasonal and narrowly linked to moisture availability in the lowlands.**

