

Magnetostratigraphy of the Pikermian fauna-bearing late Miocene central Anatolian Sivas Basin (Turkey)

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The Pikermian fauna and the Sivas Basin (Turkey)

The late Miocene Pikermian fauna

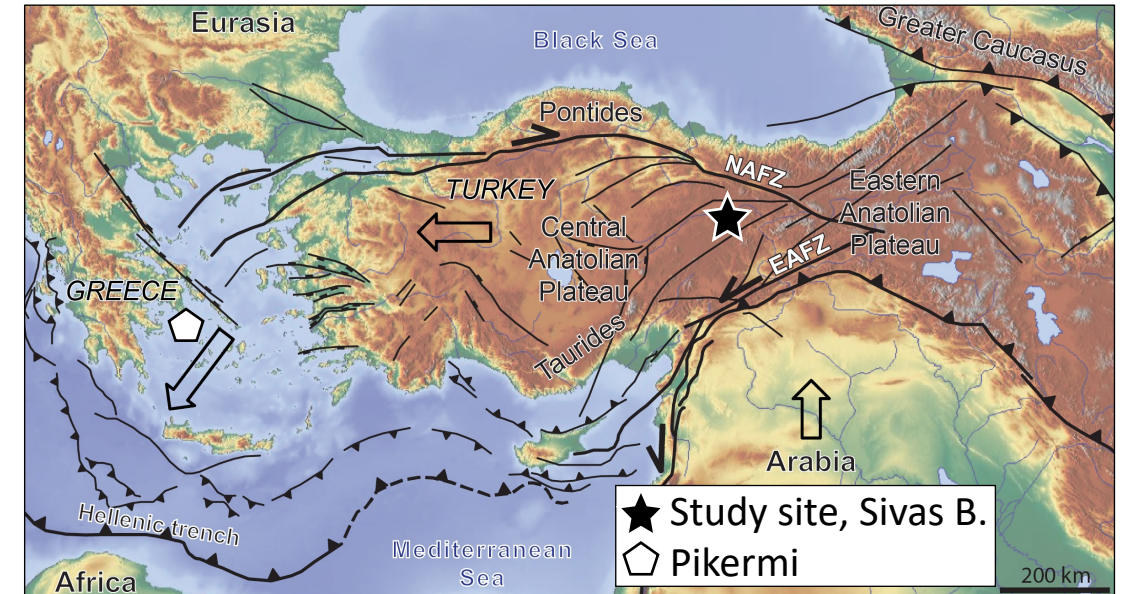
- Characterized by species adapted to an open environment and increased seasonality
- Associated with hominid findings in Turkey, Greece

Research questions

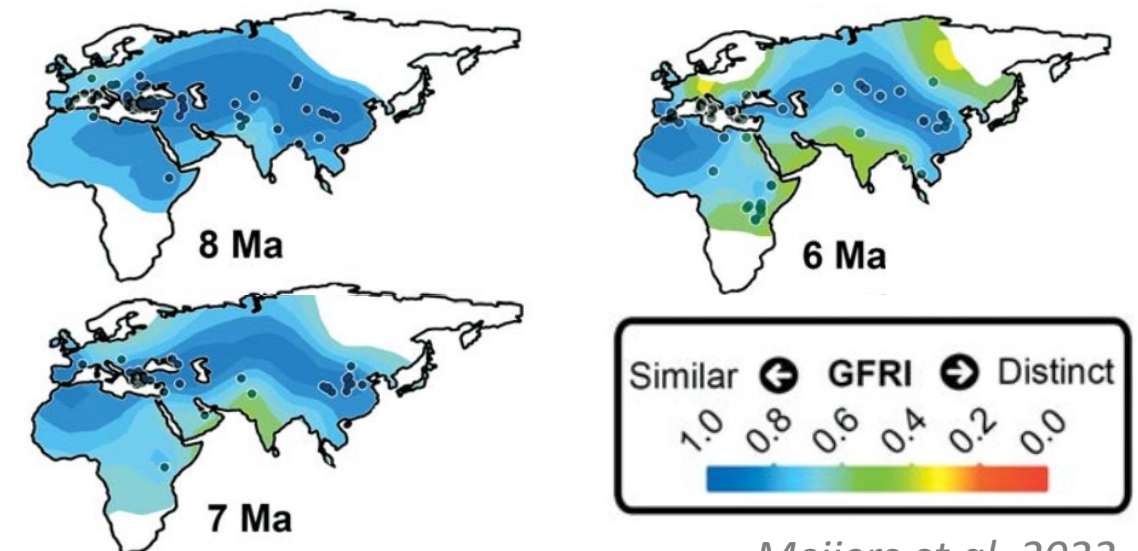
- How old are the Pikermian fauna-bearing deposits of the Sivas Basin and under what climatic condition did the Pikermian fauna thrive?
- How does this relate to time-equivalent Pikermian fauna-bearing deposits from Greece and Bulgaria?

Relevance

- Spatio-temporal variations of the Pikermian fauna and the associated climatic conditions are relevant for studies of faunal adaptation and early human evolution



Meijers, unpublished

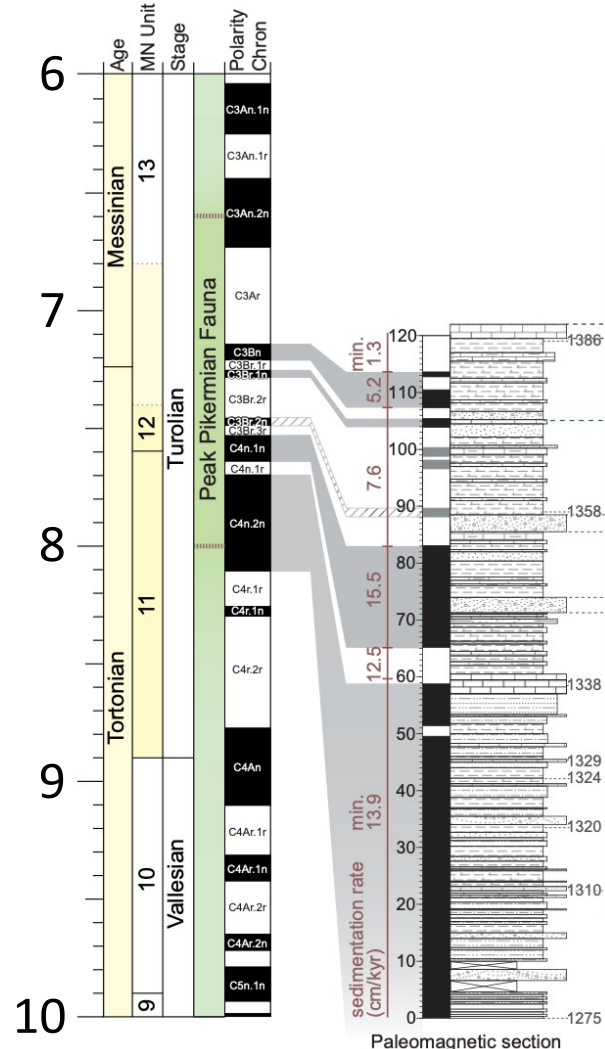


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Magnetostratigraphy and correlation to the GPTS

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Age (Ma)



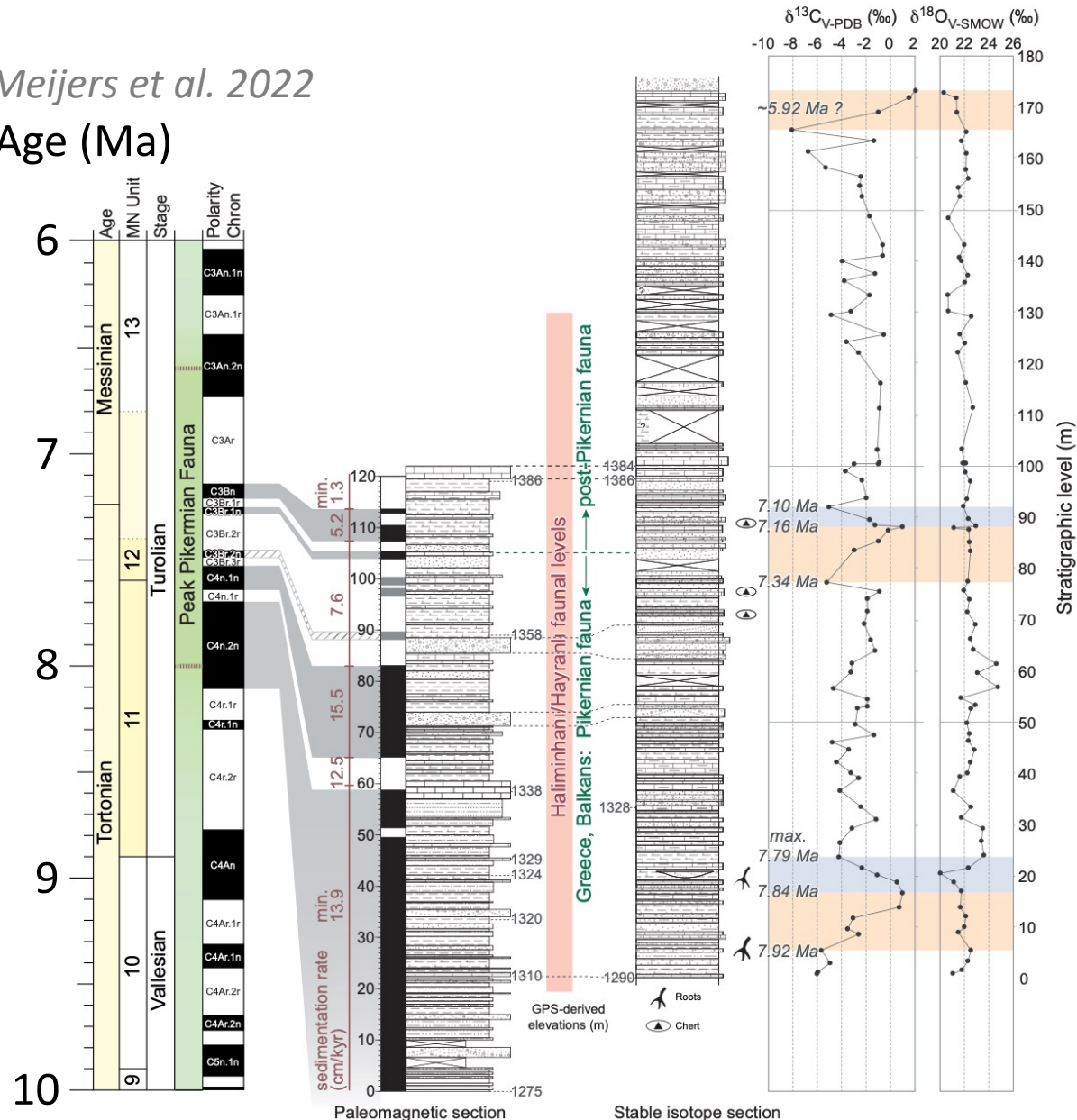
Age of the paleomagnetic section

- Magnetostratigraphy combined with existing mammal biostratigraphy
- Paleomagnetic section (120 m) covers the time span from ca. 8.1 to 7.0 Ma

Stable isotope section and mammal-bearing interval

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Age (Ma)



Age of the paleomagnetic section

- Magnetostratigraphy combined with existing mammal biostratigraphy
- Paleomagnetic section (120 m) covers the time span from ca. 8.1 to 7.0 Ma

Age of the stable isotope section

- ca. 7.9 to 5.9 Ma

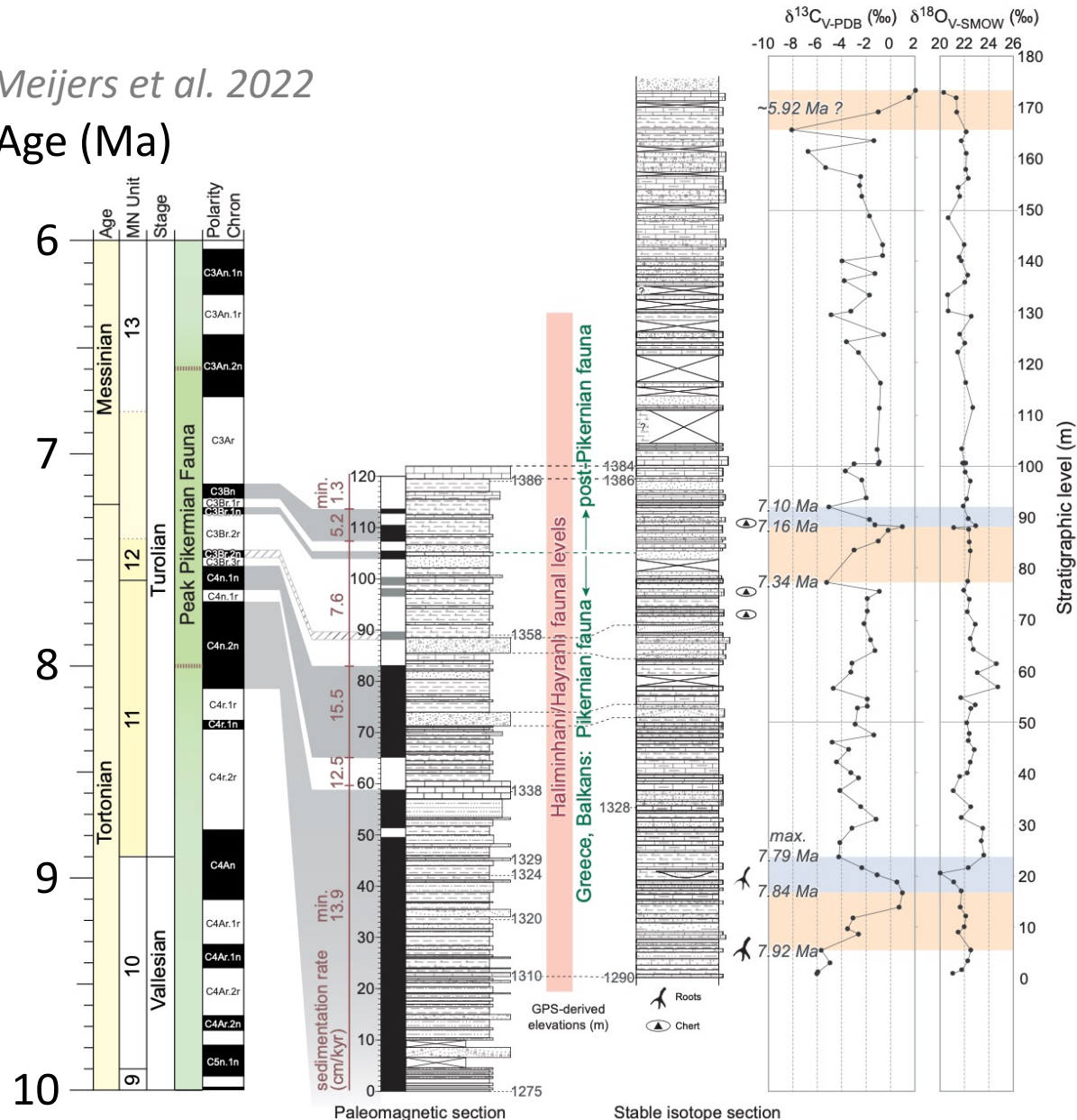
Age of the mammal-bearing interval

- ca. 8.0 to 6.5 Ma (compared to previous 8.9 to 6.8 Ma biostratigraphic age)

Climatic conditions

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Age (Ma)

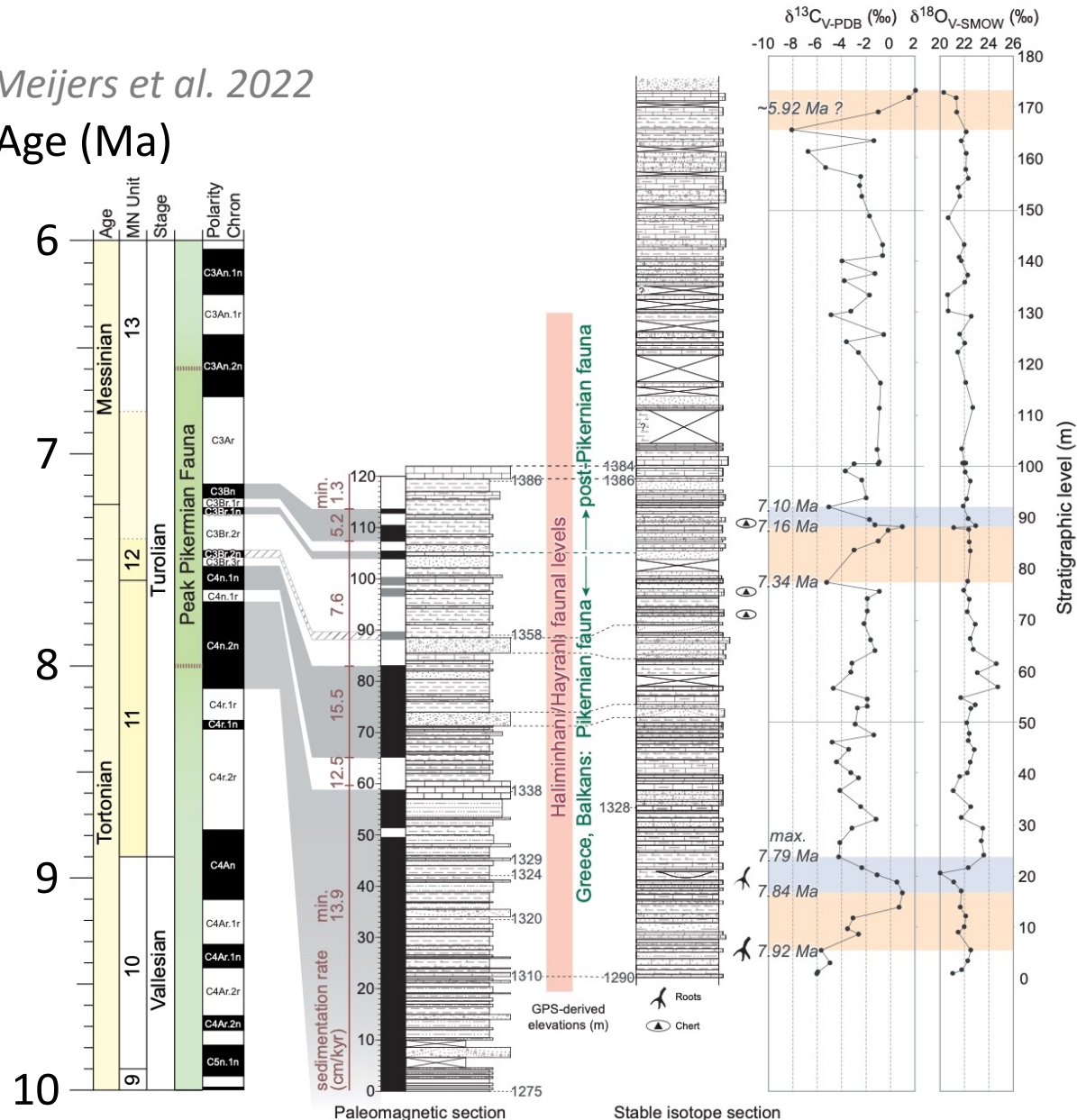


- Overall, stable local hydrological and climatic conditions with positive water balance
- Three peaks with ca. 6 to 8 ‰ increase in $\delta^{13}\text{C}$ are not associated with changes in $\delta^{18}\text{O}$
- We conclude that the increase in $\delta^{13}\text{C}$ is a result of changes in nutrient input, rather than climatic changes, which would also be reflected in the $\delta^{18}\text{O}$ values

Conclusions and implications

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Age (Ma)



Conclusions

- In the Sivas Basin, the Pikermian fauna thrived well into the Messinian
- This contrasts with Greek and Bulgarian sites (*Böhme et al. 2017, 2018*), where faunal turnover occurred across the Tortonian-Messinian boundary under a cooling climate and aridification

Why did the Pikermian fauna continue to thrive in central Anatolia?

- Formation of the central Anatolian Plateau since 11 Ma?

Thank you !

For more information:

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Article

Magnetostratigraphy of the Pikermian fauna-bearing late Miocene Sivas Basin (central Anatolia, Turkey): fluvio-lacustrine sedimentation under stable climatic conditions across the Tortonian-Messinian boundary

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Magnetostratigraphy

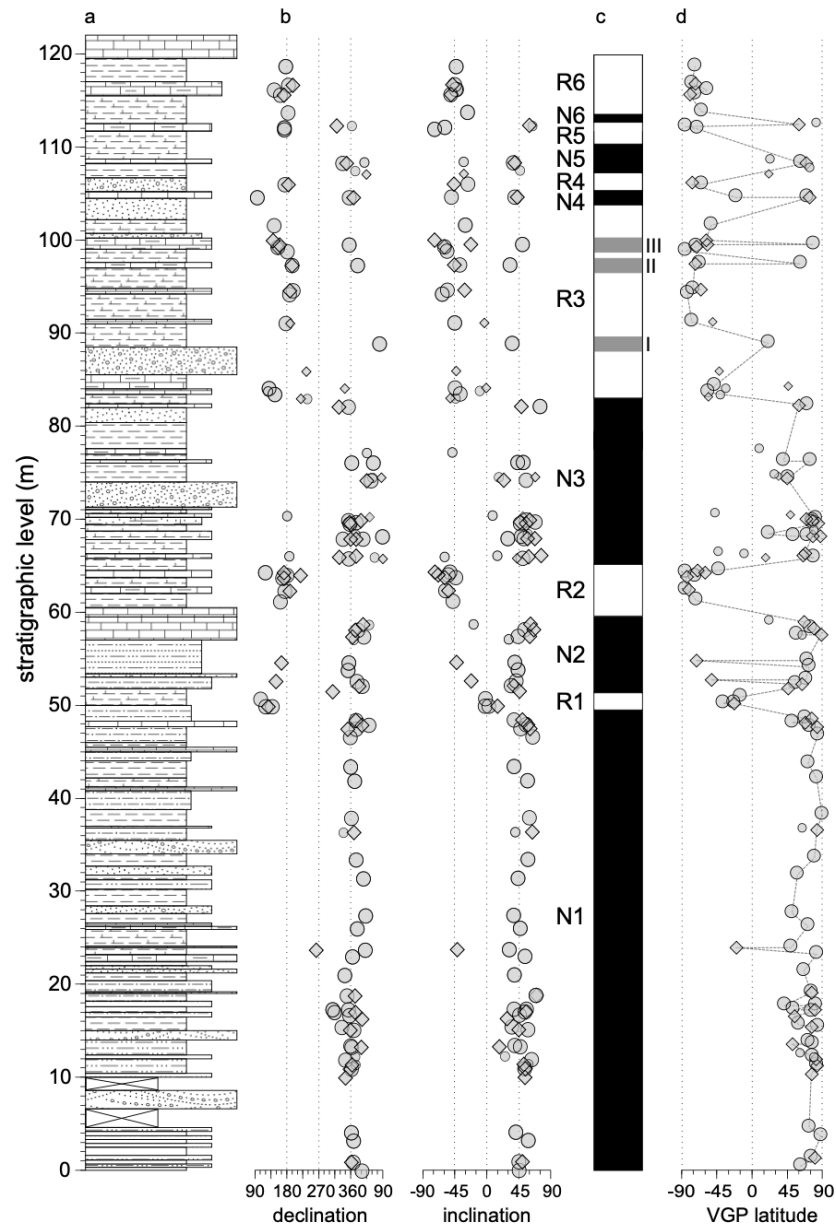


Fig. 2. a) Stratigraphic log of the magnetostratigraphic Haliminhani section. b) Paleomagnetic results (declination, inclination of the ChRM). c) (Magneto)stratigraphy of the Haliminhani section. d) VGP latitudes. Symbol legend below the figure. Grey-colored intervals indicate mixed polarity levels or single levels with an opposing polarity compared to the surrounding levels.

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Faunal similarity

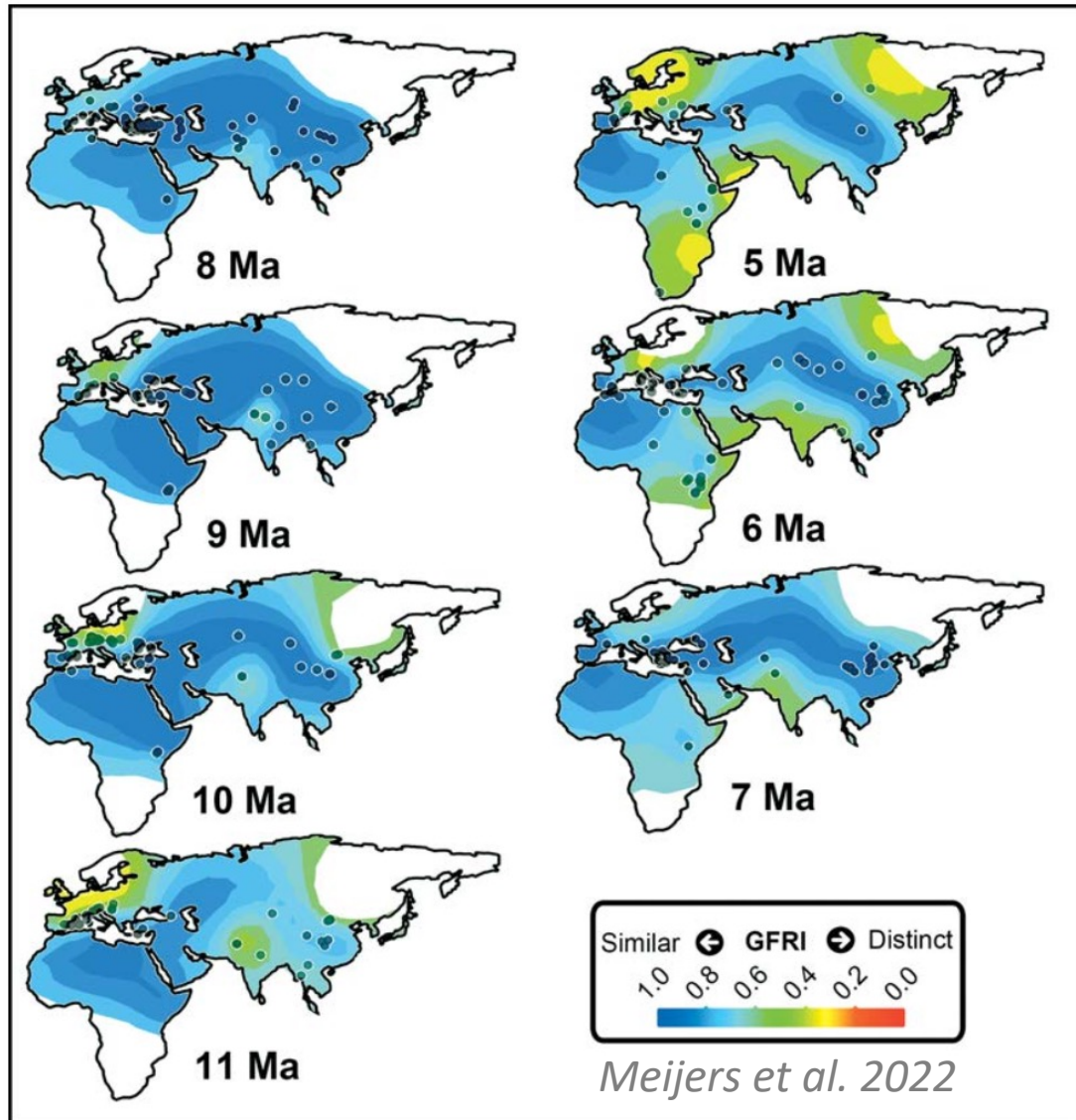


Fig. 7. Raup-Crick genus level faunal similarity to the Halimnhanı-Hayranlı site for seven time slices (11 Ma, 10 Ma, 9 Ma, 8 Ma, 7 Ma, 6 Ma, and 5 Ma) with a present-day base map. Black dots show localities for which similarities were calculated for each time slice.