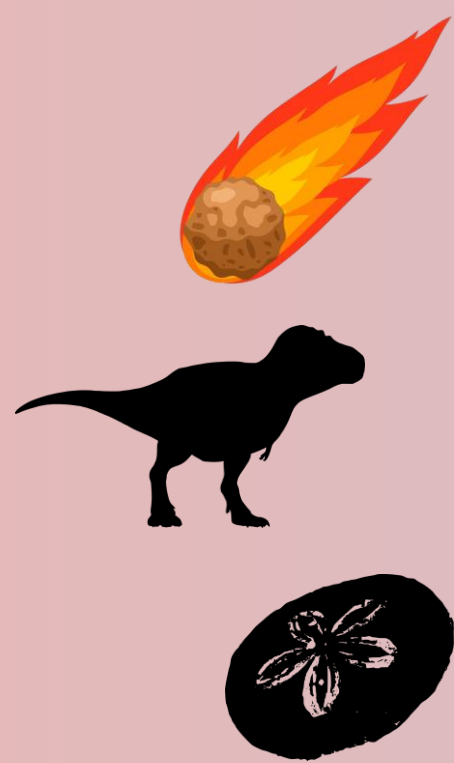




Echinoids from the Early Palaeogene (Danian) of Sangstrup Klint: Preliminary Results

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Summary

The Lower Danian (between 66-61.66 Ma) chalk beds of Sangstrup Klint were deposited shortly after the end-Cretaceous (K-Pg) mass extinction event. These beds are rich in echinoids and other macro fauna which are important for understanding the impact of the extinction event on ecosystems. However, they remain understudied with much of the focus in Denmark on boundary sections (where the physical K-Pg boundary is visible) further south. To address this scientific knowledge gap, a collection of specimens was made for the Klints, which were then also compared to other Eurasian sites to improve resolution on Danish extinction and recovery patterns. Improving our understanding of the consequences of this event are vital in understanding how natural system respond to sudden extinction events such as modern-day climate change.

Project aims

- To improve the resolution of Danish echinoid assemblages following the extinction event.
- Map wider Eurasian trends such as migration patterns and ecosystem recovery.

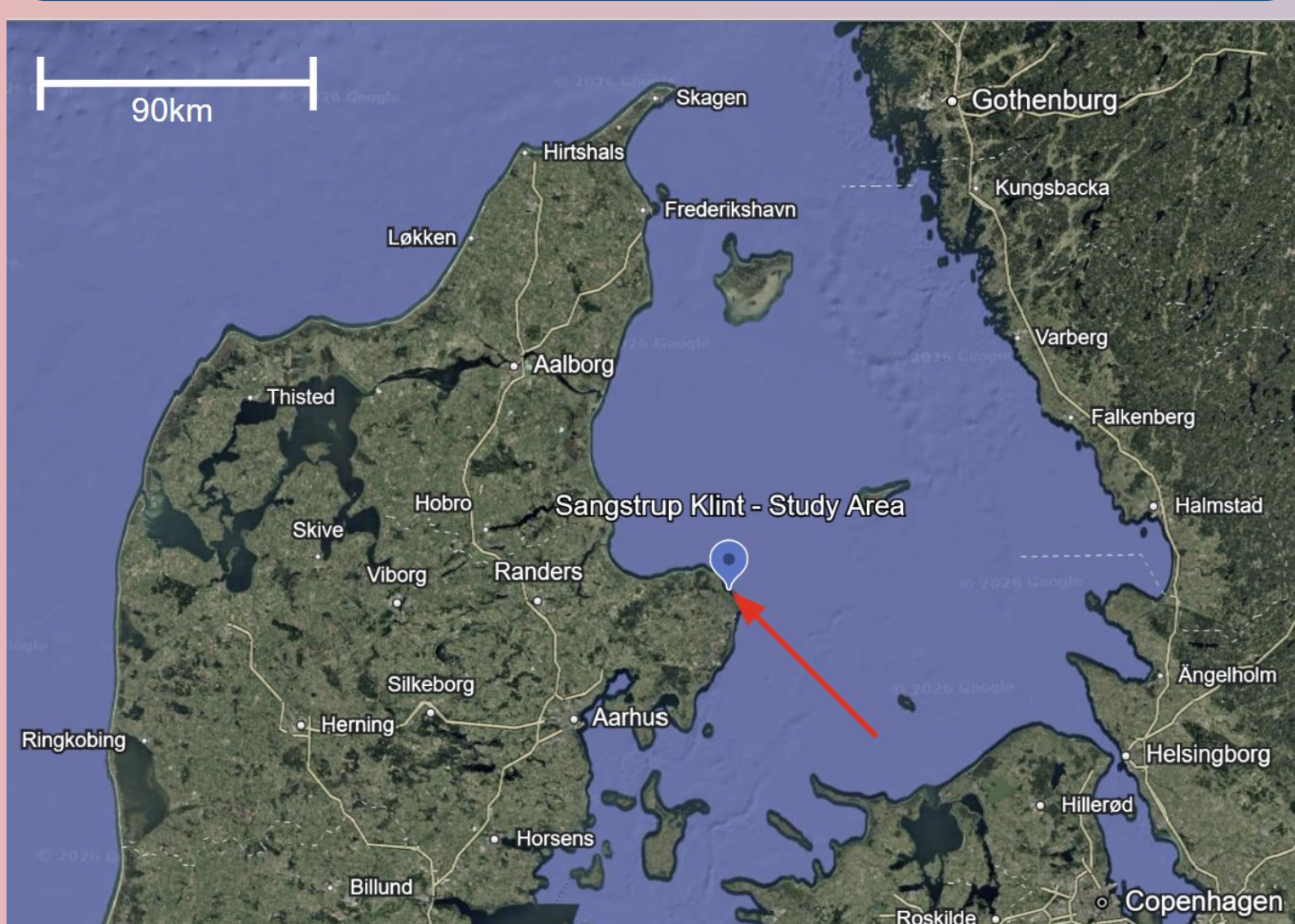


Figure 1: The location of Sangstrup Klint within Denmark (Google Earth, 2026).

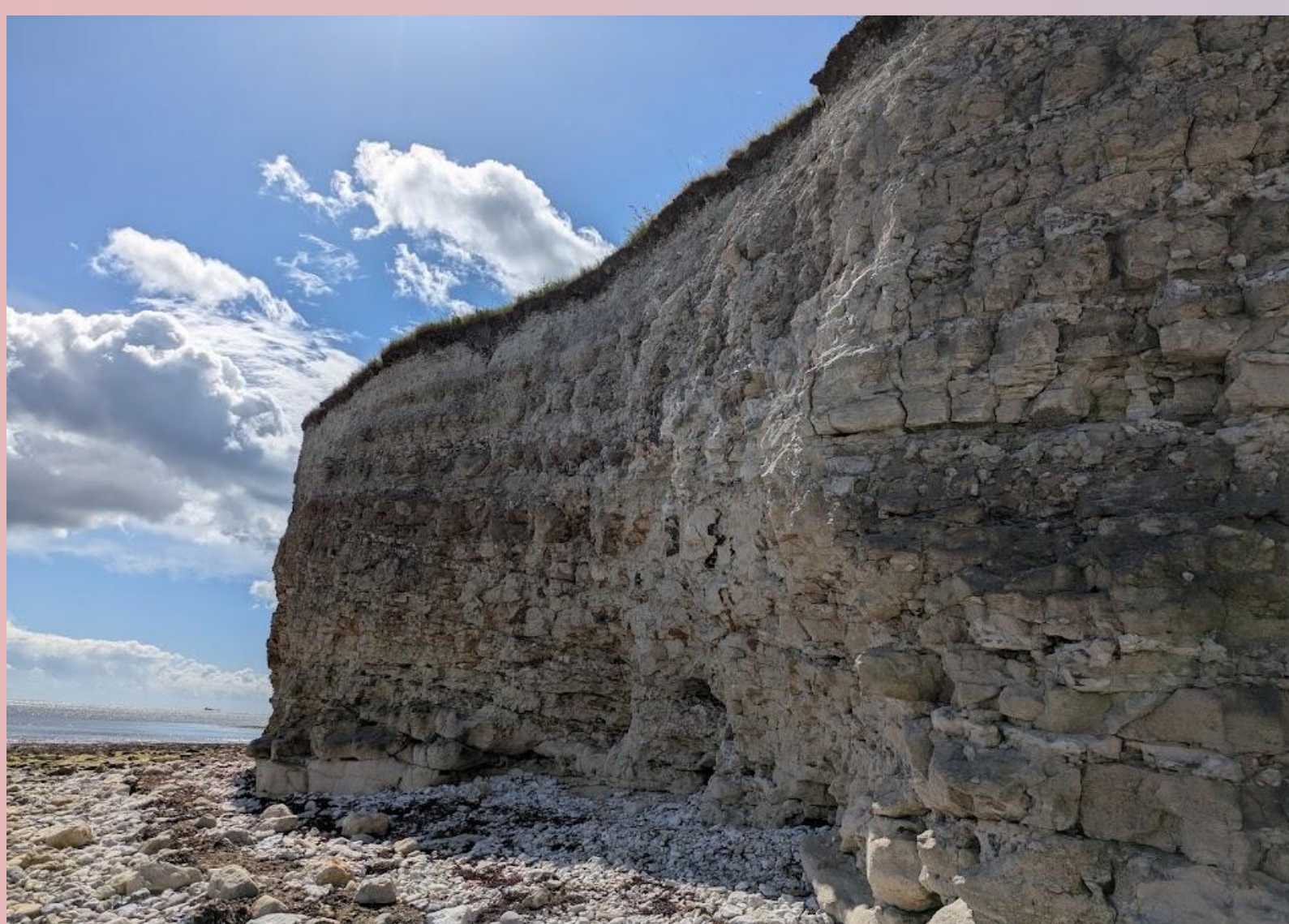


Figure 5: The eastern end of Sangstrup Klint.

Materials & Methods

- Geological observations of lithostratigraphy and diagenetic condition of materials.
- Sampling of fallen or loose rock fragments.
- Identification of specimens, description
- Study of private collection of Michael Lykke Bertelsen of Grenaa Geocenter, containing numerous echinoids collected at this location
- Data collected were compared with published literature on from other Eurasian sites.

References

Fig. 1: Google Earth (2026) 'Sangstrup Klint Area'. Google Earth Imagery. Available at: <https://earth.google.com/> (Accessed: 31 August 2026).
Scotese, C.R. (2014) *Atlas of Late Cretaceous Paleogeographic Maps, PALEOMAP Atlas for ArcGIS, volume 2, The Cretaceous, Maps 16 – 22, Mollweide Projection*. Evanston.
Jeffery, C.H. (1997) 'All Change at the Cretaceous-Tertiary Boundary? Echinoids from the Maastrichtian and Danian of the Mangyshlak Peninsula, Kazakhstan', *Palaeontology*, 40(3), pp. 659–712.

Results

- An assemblage of six species was collected during fieldwork.
- Sangstrup Klint had the same bryozoan mounds as make up many chalk deposits in Denmark.
- Samples collected were more altered than elsewhere, with common pinkish discolouration.

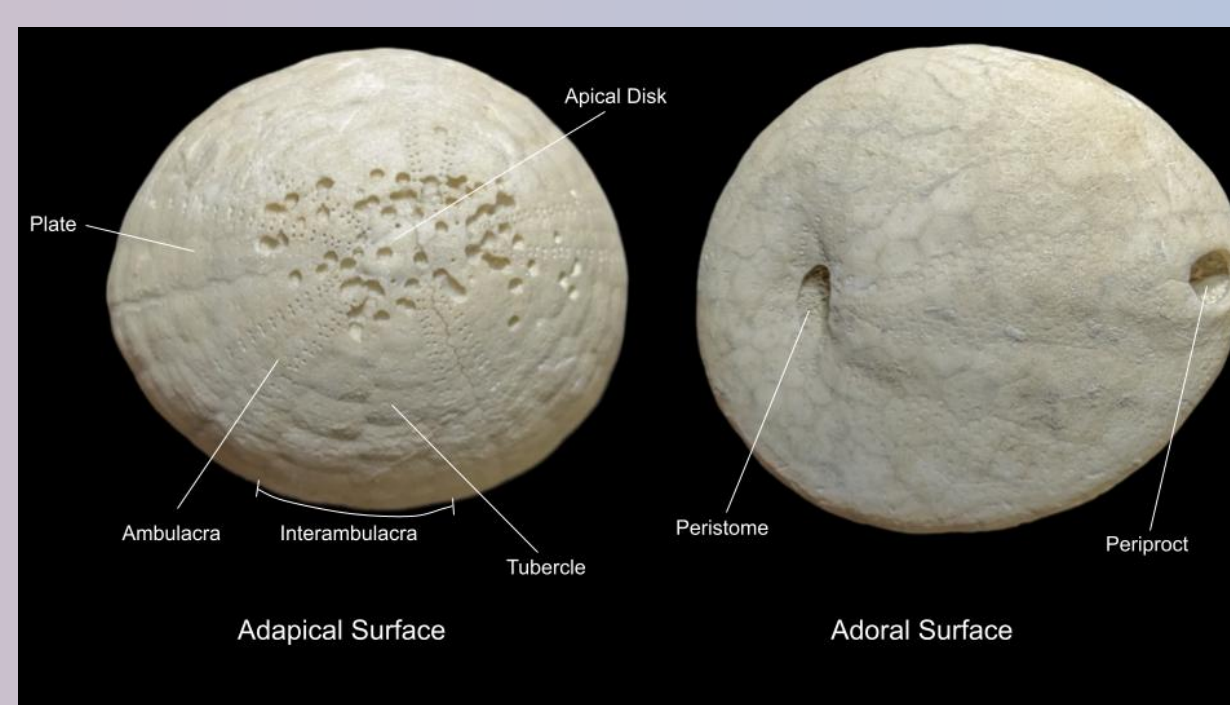


Figure 3: *Echinocorys sulcatus* specimen with main features labelled. Photographed from the private collection of M. L. Bertelsen. Units in cm.

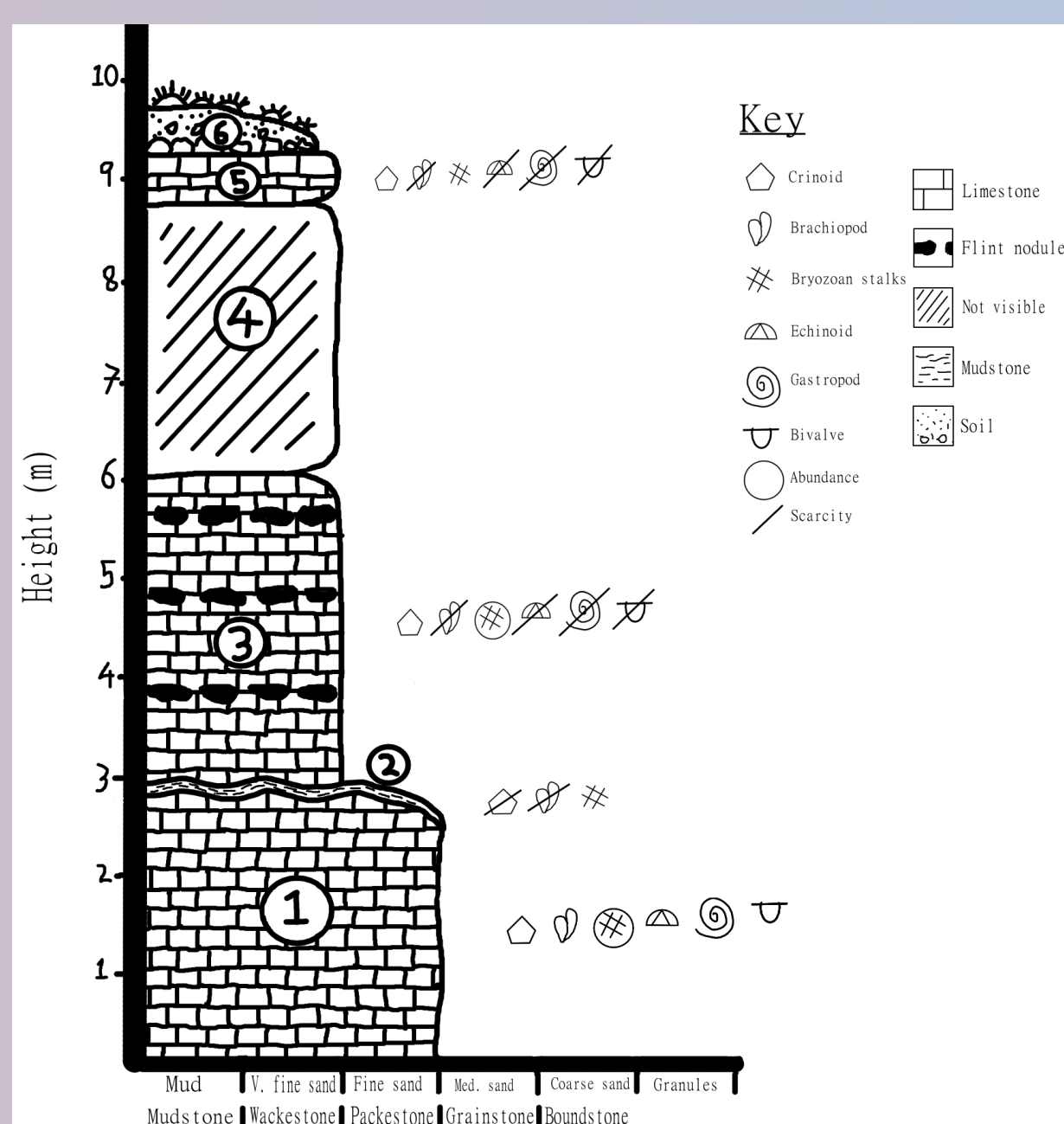


Figure 2. Stratigraphic log of eastern sampling site.

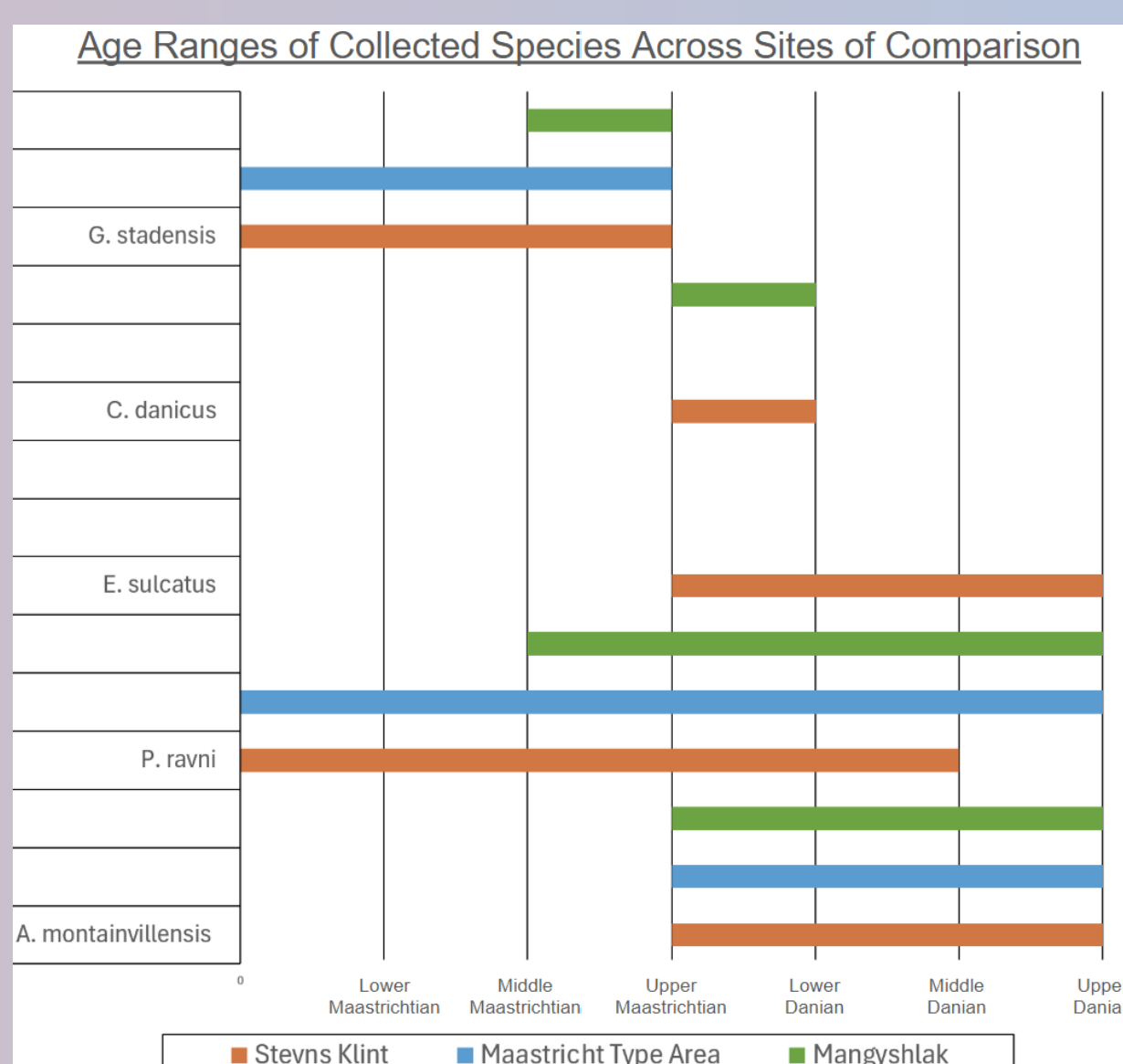


Figure 4: Age range graph of species collected at Sangstrup across sites of comparison.

Acknowledgements

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Discussion

- Two main migration patterns were identified:
- Mangyshlak was the only site to display a in the proportion of regular to irregular echinoids, highlighting that variation is continuous across scales (Jeffery, 1997).
- The Maastricht type area may have been geographically isolated from Sangstrup giving rise to different assemblages at the species level.
- The growth of bryozoan mounds at Danish sites likely provided suitable food sources for echinoids, allowing mobile species to migrate here after the extinction event.
- Later radiation of species can be used to observe the recovery of ecosystems.

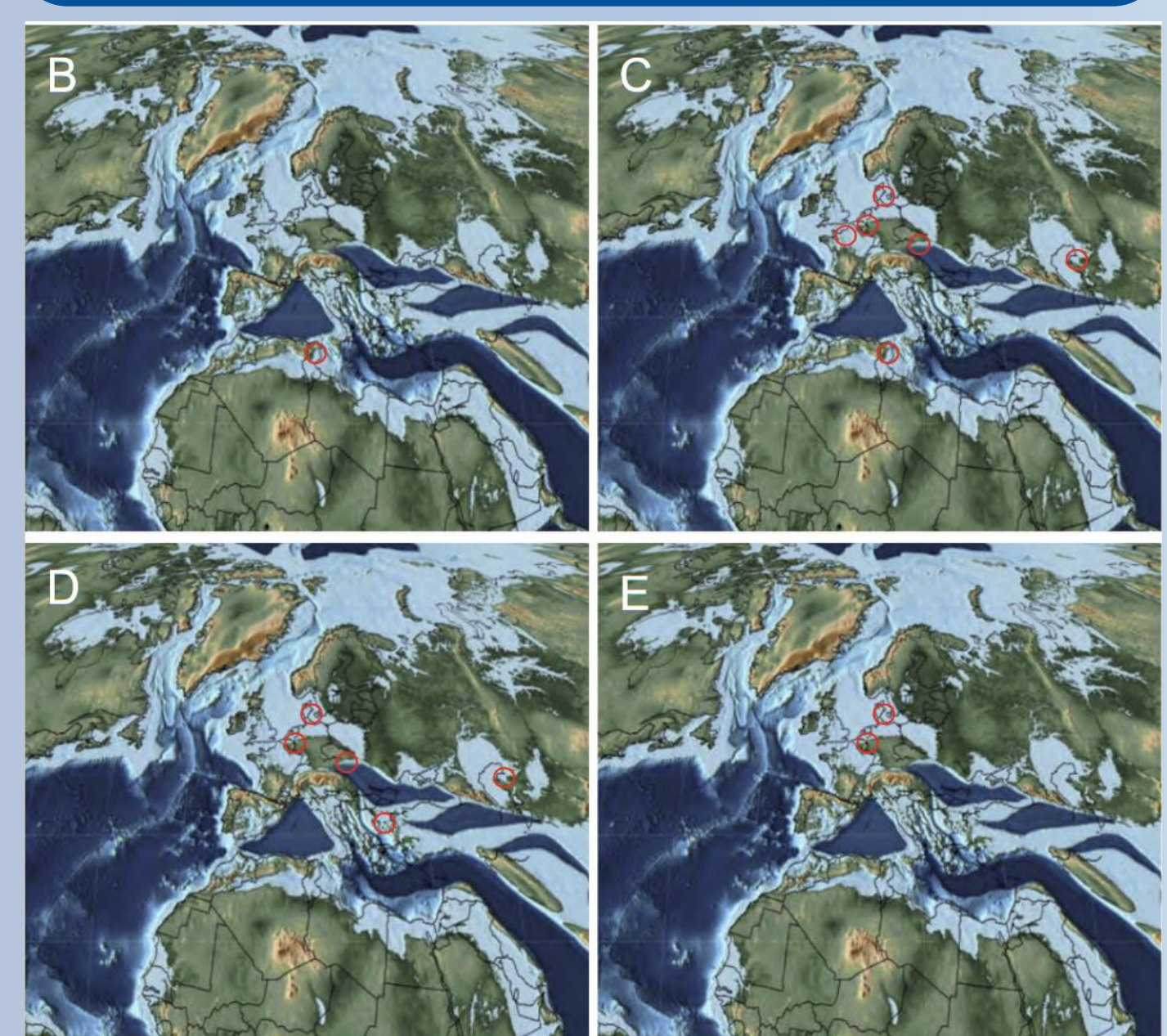


Figure 3: Modified map from (Scotese, 2014) showing recorded Eurasian occurrences of *Adelopneustes montainvillensis* in the (B) upper Maastrichtian and (C) lower Danian; recorded occurrences of *Phymosoma ravni* in the (D) upper Maastrichtian and (E) lower Danian.

Conclusions

- This study confirms that recovery trends were consistent throughout Denmark, with the initially surviving echinoid species also continuing on later into the Danian.
- The migration and mobility of species highlights the importance of migration as a reaction to catastrophic events, which can be shown here to occur over relatively rapid timescales.
- Identifying suitable and accessible environments for stressed biota might improve their survival and conservation.