**Supplementary material**

**On the timing of megafaunal extinction and associated floristic consequences in Australia through the lens of functional palaeoecology.**

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**Supplementary figure 1:** Correlation between δ18O curves used to identify tie points in core MD03-2607 and age-depth model (reproduced from De Deckker et al. (2021)’s supplementary material). (A) The δ18O of the planktic foraminifera *Globigerina bulloides* from core MD03-2607 was used to confirm the Marine Isotope Stage 5e peak at 125 ka. (B) The δ18O record of benthic foraminifera obtained from De Deckker et al. (2021) and Lopes dos Santos et al. (2012) combined. Positions of AMS 14C dates are marked in red (Lopes dos Santos et al., 2012) and blue stars (De Deckker et al., 2021), and the locations of OSL dates are marked by green stars. (C) The Intermediate Waters for the Pacific Ocean’s benthic foraminifera δ18O curve (Lisiecki and Stern, 2016). Black dashed lines indicate respective tie points and dates used in building core MD03-2607 age-depth model presented in (D) (see reference De Deckker et al. (2021)).

A picture containing text, diagram, plot

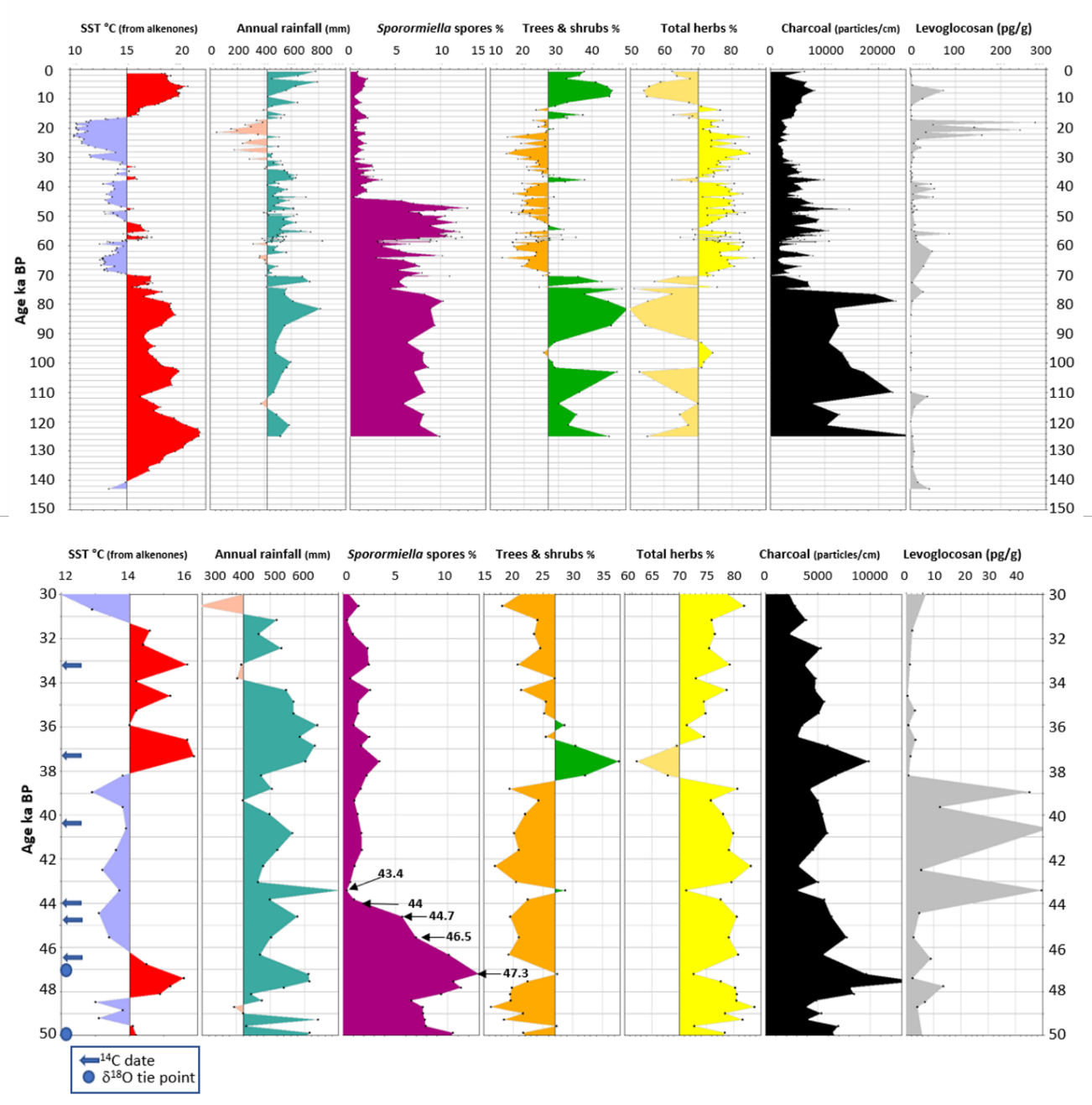
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**Supplementary figure 2:** Individual coprophilous fungal spore raw count and total diagram from core MD03-2607.

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**Supplementary figure 3:** Strong similarity between coporophilous fungal spore (CFS) concentration and influx from core MD03-2607.



**Supplementary figure 4:** Palaeoclimatic reconstructions (SST= sea-surface temperature and fossil pollen-based estimated rainfall), and percentages of fungal spores and pollen of selected taxa, as well as charcoal counts (particles/cm) (De Deckker et al., 2021), plus the biomass burning indicator Levoglucosan (pg/g) adapted from Lopes dos Santos et al. (2013). The top diagram represents the record for the entire deep-sea core MD03-2607, and the lower diagram focuses on the 50-30 ka record during which the timing of the megafaunal extinction is postulated to have occurred at 43.5 ka. Note the position of AMS14C dates and tie points from 18O of planktic foraminifera (see Fig. 3 in main text for more details). The ages listed in the *Sporormiella* diagram indicate shifts in spore abundance.

Diagram

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**Supplementary figure 5:** Percentage abundance of large-seeded pollen taxa during the megafauna extinction window from core MD03-2607. Refer to Supplementary table 1 for dispersal modes.

**References**

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