Warmer and wetter past interglacials in northeast Greenland recorded in speleothems

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1 Introduction

This study utilises inactive speleothems from northeast Greenland to investigate the palaeoenvironment under warmer and wetter climate conditions

1.1 One period of significant speleothem deposition is marine isotope stage 11 (MIS 11), an unusually long interglacial with a similar orbital composition as the Holocene (7)

1.2 Based on ancient DNA (2), Pollen (3) and the cessation of proglacial sediment deposition (4), it is known that large areas were ice-free and a boreal forest developed in south Greenland during MIS 11 but a knowledge gap exists for other parts of Greenland

2 Today’s environment and samples

2.1 The study area is located at ca. 80°N and 22°W and is characterised by an arid climate (ca. 200 mm a⁻¹, 6), permafrost and a mostly barren landscape except for a few small alpine plants and shrubs

2.2 Today’s environment inhibits speleothem deposition but caves in the region host extensive speleothem deposits: the most recent significant deposition occurred during MIS 11

2.3 Samples: several subsamples from one flowstone sequence from Flowstone Bridge Cave

3 Results

3.1 U-Th dating: samples cover the same time interval as the peak in pollen concentration in marine core (3)

3.2 Pollen analysis: pollen concentration of 2.3 grains/gram; depiction of a whole forest ecosystem with dominance of Abies and Pinus, occurrence of Fagus curious; tracing of pollen provenance is ongoing but could be regional

4 Conclusions and outlook

4.1 If the pollen are indeed of regional origin, this would provide valuable insight into the climatic conditions as well as the extent of the ice sheet in northeast Greenland during MIS 11

4.2 current focus: determine provenance of pollen and incorporate results from other caves in the area

4.3 Preserved spores leave potential for further investigations of environmental conditions

4.4 Work is ongoing to find pollen from deciduous trees make up a quarter.

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