



A green Antarctic Peninsula during warm Pliocene interglacials? A critical reassessment based on new palynofloras from James Ross Island

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The question whether Pliocene climates were warm enough to support a substantial vegetation cover on Antarctica is of great significance to the ongoing controversial debate on the stability or dynamism of Antarctic ice sheets during Neogene warm periods. Here we present a systematic palynological comparison of pollen and dinoflagellates assemblages of Pliocene diamictites from the northern Antarctic Peninsula. The sedimentary sequences are exceptionally well dated using a combination of $^{40}\text{Ar}/^{39}\text{Ar}$ and $^{87}\text{Sr}/^{86}\text{Sr}$ on interbedded lavas and pristine bivalve molluscs. The pollen bearing sediments were most probably deposited during warm and seasonally ice-free conditions. Pollen assemblages are dominated by *Nothofagidites* spp., *Podocarpidites* spp. and *Cyathidites* spp., suggesting contamination with older, pre-Neogene material. In order to distinguish between reworked and in-situ palynomorphs, we applied different methods, including fluorescence microscopy, which were used in previous publications to reconstruct potential Neogene vegetation. Our results indicate a purely Cretaceous and early Tertiary origin of pollen and spores and challenge previously published reconstructions of a Pliocene tundra vegetation on Antarctica.