Goldschmidt 2025 Abstract
https://doi.org/10.7185/gold2025.30215

No late Ediacaran glaciation recorded in the Nama Group

IONA M BAILLIE[1], LYLE NELSON[2], JOHN ALMOND[3], ROGER SWART[4], CAMERON PENN-CLARKE[5], DANA POLOMSKI[2], LUCY HELMS[1], JESSICA CARDY[6], KESIA BEZUIDENHOUT[7] AND EMMY SMITH[1]

[1]Johns Hopkins University
[2]Massachusetts Institute of Technology
[3]Natura Viva cc
[4]Blackgold Geosciences
[5]Evolutionary Studies Institute
[6]University of Aberdeen
[7]University of Namibia

In contrast to the Cryogenian Period (720-635 Ma) which is renowned for long-lived, low-latitude 'Snowball Earth' glaciations, climate in the Ediacaran Period (635-538 Ma) remains more poorly constrained. Approximately 45 Ediacaran-aged glacial deposits have been reported from strata spanning high to low paleolatitudes, yet for many of these purported glacial units, age constraints and/or published sedimentological evidence for glaciation are limited. One of the purported late Ediacaran glacial deposits is found in the marine strata of the c. 545 Ma Vingerbreek Member of the Nama Group in Namibia and South Africa. Paleogeographic reconstructions suggest that Ediacaran strata deposited on/fringing the Kalahari Craton were deposited at 30-40º south. For ice to reach sea level at these latitudes, climate models require an unstable, globally significant cooling interval, which could have come close to tipping the world into another 'Snowball' state. Here, we present field results that demonstrate that deposits previously interpreted as evidence for late Ediacaran Vingerbreek glaciation can instead be explained by a combination of 1) misidentified Permo-Carboniferous glacial deposits of the Dwyka Formation and 2) non-glacial Ediacaran-age deposits. Together, these results demonstrate that there is no robust evidence for Ediacaran glaciation in southwestern Africa, an important constraint on the global climate state during the early radiation of animals.