

**Preservational and morphological variability of assemblages of
agglutinated eukaryotes in Cryogenian cap carbonates of northern
Namibia**

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ABSTRACT

Laminated carbonates of the Rasthof Formation, deposited in the aftermath of the early Cryogenian low-latitude glaciation (Sturtian, 717–662 Ma), preserve abundant round tests of agglutinated microscopic eukaryotes. Previously, fossil tests were reported in two localities (Ongongo and Okaaru) from microbially laminated carbonates in the Rasthof Formation, which revealed a previous unexplored Cryogenian taphonomic window. In order to better understand the lateral variability in these microfossil assemblages, this work systematically examines fossil tests from two additional localities, South Ombepera and Ombepera, and compares their preservation in thinly and thickly laminated microbial laminites. Cap carbonates in South Ombepera and Ombepera contain abundant, hollow, spheroidal agglutinated tests (50 to 225 μm in diameter). Some of these tests exhibit slitlike or triangular apertures. In contrast, much larger, oval tests with a tapering end dominate the assemblages at Okaaru, whereas oval, laterally compressed and round structures with slits, visors, or central apertures are found at Ongongo. The thinly laminated microbial laminites from Ombepera, South Ombepera, and Okaaru also preserve rare agglutinated tubes attributed to fossils of early Foraminifera. At all four localities, the thinly laminated microbial laminites preserve more microfossils than thickly laminated microbial laminites although these two facies commonly interfinger and are interbedded. This difference shows that conditions present during formation of the thinly laminated microbial laminites favored the preservation of round agglutinators, perhaps during early burial, lithification, and fossilization of the test walls.