

Turee Creek Group microfossils highlight early Paleoproterozoic diversity and complexity

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Fossil assemblages in the early Paleoproterozoic are rare, making it difficult to evaluate the link between the Great Oxidation Event (GOE) and the evolution of early life. We report a new suite of microfossils from the c. 2.45 to 2.21 Ga Turee Creek Group (TCG), Western Australia, which provides insight into the microbial life present during this uncharted period [1].

This new microfossil suite consists of two distinct communities preserved in deep water black chert units:

1. A primarily in situ benthic community in nodular black chert, which includes a range of long filamentous forms, unicells, fine filamentous rosettes, and large (up to 138 μm diameter) spherical aggregates of cells.

2. A transported, originally shallower-water, community preserved in black chert beds that includes unicells of a wide size distribution, generally short filamentous forms, *Eoastrion*-like and *Kakabekia*-like rosettes, and large, complexly-branching forms.

In total, 18 microfossil morphotypes are reported, including two new forms previously unknown from the literature, as well as a number of morphologies that are similar to - but 400-500 Ma older than - type specimens from the c. 1.88 Ga Gunflint Iron Formation [2].

This new suite of TCG microfossils shows that early Paleoproterozoic life was more diverse and complex than previously known, and provides a new benchmark for assessing the impact of the GOE on the biosphere.

[1] Barlow & Van Kranendonk (*in review*) *Geobiology*.

[2] Barghoorn & Tyler (1965) *Science* **147**, 563-575.