

## Life cycle reconstruction and taxonomy of Archean (3.0Ga) microfossil assemblage

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Carbonaceous chert of the 3.0 Ga. Farrel Quartzite in the Pilbara Craton, Western Australia contains abundant lenticular microfossils with flange-like appendage that range mostly from 30 to 40 microns and are up to 100 microns along the major dimension. They are distinct from the other Archean microfossils in their morphology. It may be also mentioned that FLM are organic-walled and extractable by HCl-HF maceration.

The author examined more than 2000 specimens of this flanged lenticular microfossil (FLM) and other morphological types, and identified the following distinct individuals and complex modes of occurrences; 1) specimens with small spheroidal objects inside; 2) colonies composed of mixture of small spheroids and FLM; 3) specimens that appear to expel a single spheroid; 4) dumbbell- or chain-like structures. Since the biogenicity of FLM has already been well established by previous multiple studies of wide range, the specimens and occurrences described above are likely interpreted in the context of life cycle variants and taxonomy. Microfossils conveniently called FLM are believed to be composed of at least two taxa or more. One species represents microbes that was reproduced by multiple fissions, whereas the other by ordinary binary fission. The latter occasionally formed chain-like structures. Either or both of these species might have produced spore. Although these interpretations may be taken as "vaporous", the presence of FLM in the 3.0 Ga. and older succession (the 3.4 Ga. Strelley Pool Formation) is now firmly established, and they may provide quite important information about the early evolution of life.

Keywords: Archean, microfossils, life cycle, taxonomy, Pilbara