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# Organic walled microfossils from the Neoproterozoic Owk Shale, Kurnool Group, South India

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**Abstract**

An assemblage of organic walled microfossils (OWM) of 17 taxa belonging to 10 genera is reported from the Neoproterozoic Owk Shale of the Kurnool Group, South India. The assemblage comprises sphaeromorphs, colonial aggregates, filamentous forms, spiral cylindrical filaments belonging to cyanobacteria, problematic acanthomorphic acritarchs, Netromorphic, Sphaeromorphic and Acantomorphic groups. The assemblage includes cyanobacteria: *Siphonophycus kestron*, *S. robustum*, *S. typicum*, *S. solidum*, *Polytrichoides lineatus*; Netromorphic acritarch: *Arctacellularia tetragonala*, *Navifusa majensis*, *Jacutianema solubila*; Sphaeromorphic acritarch: *Ostiana microcystis*, *Synsphaeridium* spp., *Leiosphaeridia minutissima*, *L. tenuissima*, *L. crassa*, *L. jacutica*, *L. ternate*; and Acanthomorphic acritarch: *Cavaspina* aff. *C. acuminata* and *Variomargosphaeridium* aff. *V. litoschum*. The age conundrum of Kurnool Group (Mesoproterozoic versus Neoproterozoic) is discussed. On the basis of the reported OWM assemblage the age of the Kurnool Group is established as Neoproterozoic.


*Keywords:* Microfossils; Acritarchs; Systematics; Kurnool; Neoproterozoic; India

## 1. Introduction

Proterozoic microfossils not only provide a major source of palaeontological information, essential for understanding early life and evolution, but are also helpful in biostratigraphic correlations and palaeoenvironmental reconstructions of the Proterozoic successions (Butterfield and Chandler, 1992; Knoll et al., 2006; Sergeev et al., 2008, 2012; Knoll, 2009; Baludikay et al., 2016; Loron, 2016; Javaux and Knoll, 2017). The assemblage of microfossils comprising eukaryotes, colonial forms, processed acritarchs and spiral forms reveal the steps in the evolution, innovation, and patterns of diversification of different clades of life (Moczydłowska, 2005; Javaux, 2011; Butterfield, 2015; Javaux and Knoll, 2017). In the absence of absolute dating of Proterozoic sedimentary successions, some characteristic and index microfossils are used as a suitable tool to decipher the age of the fossil-bearing strata. In comparison to the Palaeoproterozoic fossil assemblages, microfossils of the Neoproterozoic Era (1000–541 Ma) are better preserved, diversified and quantitatively abundant (Butterfield and Chandler, 1992; Zang and Walter, 1992a, 1992b; Butterfield et al., 1994; Knoll et al., 2006; Sergeev et al., 2008, 2012; Knoll, 2009; Baludikay et al., 2016; Loron, 2016; Javaux and Knoll, 2017). The palaeobiological assemblages of the Neoproterozoic Era are characterized by the advent of large acritarchs, diversification of eukaryotes, the origin of multicellular individuality, and the occurrence of megascopic life and bio-mineralization (Moczydłowska, 2005; Javaux, 2011; Butterfield, 2015; Javaux and Knoll, 2017). Sixty years ago, the discovery of rich microfossil assemblages from the Neoproterozoic Bitter-Springs Formation of central Australia opened the window for microfossils studies (Schopf, 1968; Schopf and Blacic, 1971). Subsequent studies of the Neoproterozoic successions in different parts of the world revealed the diversity of biological forms present in the varied ecosystems of this era (Schopf, 1968; Schopf and Blacic, 1971; Knoll et al., 1991; Butterfield et al., 1994; Hofmann and Jackson, 1994;

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