

## THE PALAEOECOLOGY OF SOME UPPER CAMBRIAN MICROBIAL-SPONGE-EOCRINOID REEFS, CENTRAL TEXAS.

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Abundant metazoan reef development in shallow shelf seas has been a feature of much of the Phanerozoic. The Upper Cambrian, however, is one of the periods generally perceived as lacking this development. It falls after the extinction of archaeocyath sponges and before the Ordovician expansion of lithistid sponges, stromatoporoids and corals. This paucity of framebuilding metazoans has been interpreted as producing simple ecologies, dominated by filamentous calcimicrobes forming 'thrombolitic' and 'stromatolitic' bodies. Examples of reefs of this age are also uncommon and this may have led to the wide acceptance of these generalisations.

The Upper Cambrian (Franconian) Morgan Creek Limestone part of the Wilberns Formation, Central Texas is a 50m thick unit composed largely of trilobitic and echinoderm debris grainstone. The upper 10 metres contains a series of metre-scale bioherms exposed in Squaw, Rocky and Threadgill Creeks, in Gillespie and Mason Counties. Contrary to previous work, these reefs are seen to have a complex ecology of epifloral and cryptic calcimicrobes, lithistid sponges, eocrinoids and various vagrant metazoans.

A temporal variation in community structure has been noted. Earliest reefs are small 30cm communities dominated by self-encrusting 'arboreal' eocrinoid colonies and sponges. The next phase has perhaps the most complex ecology of any Upper Cambrian reefs and involves a framework of various calcimicrobes and the lithistid sponge *Wilbernicyathus donegani* Wilson. The eocrinoids are still present, but no longer as framework elements. A third phase is probably heralded by a fall in relative sea-level. Sponges and eocrinoids disappear, microbial diversity greatly reduces and the reefs comprise columnar 'mesostromatolites' up to 2cm across built by filamentous calcimicrobes. Periodic erosional storm events precede a termination event and influx of silt.