

Thesis abstract

Palaeontology, taxonomy and biostratigraphy of Cambrian assemblages from the Pertaoorrta Group, Amadeus Basin, Northern Territory

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The Amadeus Basin is a large sedimentary province in central Australia that covers an approximate area of 170,000 square kilometres. Despite the known occurrence of fossils from the majority of stratigraphic units within the Cambrian Pertaoorrta Group there is a dearth of published palaeontological data, including no comprehensive biostratigraphy.

Presented as part of this thesis is a detailed investigation into three formations spanning the Cambrian Series 2–3 units of the Pertaoorrta Group. The oldest of these, the Tempe Formation and Giles Creek Dolostone have previously been regarded as coeval. Examination of specimens from both drillcore and outcrop material from these two formations revealed a considerable diversity of new and biostratigraphically-informative fossils. The described taxa provide evidence that these two sedimentary units were deposited at different times. The Tempe Formation (in Paper 1) belongs to the Ordian, whereas the fauna from the Giles Creek Dolostone (in Papers 2–4) is distinctly younger and correlates with the overlying early Templetonian. These results suggest that the current regional stratigraphic scheme needs to be amended.

The youngest stratigraphic unit examined in this thesis is the Goyder Formation (in

Paper 5). The initial age estimates for this formation were based solely on vague reports of trilobites. Our collections demonstrate that the Goyder Formation contains a highly diverse fossil fauna with at least 20 different trilobite taxa. This assemblage indicates a late Mindyallan age (equivalent to Cambrian Series 3, Guzhangian) within the *Glyptagnostus solidotus* Zone.

Detailed logging and sampling through formations in the Pertaoorrta Group has allowed for precise ages where little to no biostratigraphic data had previously been available. These ages have facilitated the development of a preliminary quantitative biostratigraphy of the Cambrian Series 2–3 portion of the Amadeus Basin, thus permitting more accurate intra- and interbasinal correlation.

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