

Paper Number: 1179

The *Daptocephalus* Assemblage Zone (Lopingian), South Africa: A proposed biostratigraphy based on a new compilation of stratigraphic ranges

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The *Dicynodon* Assemblage Zone (DiAZ) of South Africa's Karoo Basin is one of the eight biostratigraphic zones of the Beaufort Group. It spans the uppermost Permian strata (Balfour, Teekloof, and Normandien formations) and traditionally has been considered to terminate with the disappearance of *Dicynodon lacerticeps* at the Permo-Triassic Boundary. We demonstrate that the three index fossils currently used to define the *Dicynodon* Assemblage Zone (*Dicynodon lacerticeps*, *Theriongnathus microps*, and *Procynosuchus delaharpeae*) have first appearance datums (FADs) below its traditionally recognized lower boundary and have ranges mostly restricted to the lower portion of the biozone, well below the Permo-Triassic Boundary [1].

We propose re-establishing the revived *Daptocephalus leoniceps* [2] as an index fossil for this stratigraphic interval, and reinstating the name *Daptocephalus* Assemblage Zone (DaAZ) for this unit. Furthermore, the appearance of *Lystrosaurus maccaigi* in the uppermost reaches of the biozone calls for the establishment of a two-fold subdivision of the current *Dicynodon* Assemblage Zone. The biostratigraphic utility of *Da. leoniceps* and other South African dicynodontoids outside of the Karoo Basin is limited due to basinal endemism at the species level and varying temporal ranges of dicynodontoids globally. Therefore, we recommend their use only for correlation within the Karoo Basin at this time.

Revision of the stratigraphic ranges of all late Permian tetrapods does not reveal a significant change in faunal diversity between the lower and upper DaAZ. However, the last appearance datums of the abundant taxa *Di. lacerticeps*, *T. microps*, *P. delaharpeae*, and *Diictodon feliceps* occur below the three extinction phases associated with the end-Permian mass extinction event [3]. Due to northward thinning of the strata however, the extinction phases may not be fully represented in this part of the basin.

References:

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