



Equatorial Gondwanan History and Early Palaeozoic Evolutionary Dynamics



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[Oral 17] Dissecting ‘global’ biodiversity patterns of the early Palaeozoic radiation(s)

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ABSTRACT

The early Palaeozoic radiation has generally been documented through the promotion of discernible ‘global’ events. The Cambrian ‘Explosion,’ placed by most authors in an interval around -540 and -520 million years ago (Ma), is considered to be an abrupt appearance in the fossil record of most animal phyla, with a sudden, or almost sudden increase in complex morphologies across the metazoan groups. In a few recent papers, the Great Ordovician Biodiversification ‘Event’ (GOBE) has similarly been restricted to a single dramatic diversification ‘event’ in the Darriwilian Stage of the Middle Ordovician Series, between 470 and 455 Ma, although historically the diversification is considered as an aggregation of radiation ‘events’ capturing a large and complex increase of taxonomic diversity of marine invertebrates covering the entire Ordovician.

In analogy with studies of other, more recent geological intervals, it becomes more and more clear that the ‘global’ palaeodiversity curves for early Palaeozoic marine faunas, based on ‘global’ databases, are not truly global, because the data from different geographical areas through the different intervals vary substantially during the early Palaeozoic. The dissection of the underlying patterns in the ‘global’ diversity curves clearly indicates significant disparities. These variations of the biodiversity signals can be related to the biases of the palaeogeographical coverage of the data, but also to the relative weight of the different fossil groups in the ‘global’ curves.

Scrutiny of currently available, but also unpublished, datasets reveals that an abrupt ‘explosion’ of diversity in the Cambrian or a significant ‘event’ in the Ordovician are not visible, except when restricting the curves to data from specific fossil groups from particular areas. It becomes evident that the datasets remain incomplete, in particular those for many geographical areas and for several fossil groups, that are not covered by the ‘global’ databases.

In conclusion, some recently published biodiversity curves have to be treated with caution, as truly global diversity estimates of marine organisms during the early Palaeozoic remain insecure based only on current global databases.

Keywords: Cambrian explosion, Ordovician radiation, diversification.