

Zooming in on the GOBE

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The great Ordovician diversification of echinoderms: deciphering a complex global signal

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The most dramatic increase in echinoderm diversity and disparity took place during the Ordovician, with a peak of about 15 classes instead of e.g. only 5 in the latest Cambrian (Furongian) and in post-Palaeozoic seas. The global analysis of about 2,000 Ordovician echinoderm taxa recovered from over 300 areas worldwide suggests that their diversity remained relatively low from the Tremadocian to the Dapingian, before rising from the Darriwilian to the Katian, and finally collapsing in the Hirnantian. Taxonomically, this pattern largely depicts the major diversification of crinoids, which represent from 30 to 70 percent of the whole echinoderm diversity, and become, during the Ordovician, one of the major components of marine ecosystems. However, the analysis of the geographic origin of included taxa indicates a strong historical and/or sampling bias towards Laurentian faunas (e.g. North America, Scotland; 20 to 50 percent of the data), themselves largely dominated – faunistically – by crinoids. Zooming in on the situation in other well-represented areas in the database (e.g. Avalonia, Baltica, high-latitude Mediterranean Province) provides distinct regional temporal patterns of biodiversity, and especially on non-crinoid-dominated faunal compositions. However, Ordovician echinoderm faunas remain very poorly known in many other areas in the world (e.g. Australia, Central and Southeastern Asia, China, South America, Siberia). In recent years, significant sampling efforts in some areas (e.g. Morocco) have significantly modified our knowledge of some regional faunal assemblages and contributed to fill in databases, which, however, still remain largely dominated by data from a single palaeocontinent.