

Geographic Variability in Recovery Patterns from the Late Ordovician Mass Extinction

Andrew Z. Krug

*Department of Geosciences
The Pennsylvania State University
University Park, PA, 16802
USA
akrug@geosc.psu.edu*

Mark E. Patzkowsky

*Dept. of Geosciences
The Pennsylvania State University
USA*

Mass extinctions play an important role in the evolution of complex life due to their ability to remove ecological dominants from the global ecosystem. Understanding the evolutionary role of mass extinctions requires regional studies of extinction, survival, and recovery. Here, we compare sampling standardized diversity dynamics between the paleocontinents of Laurentia and Baltica spanning the Late Ordovician mass extinction and Early Silurian recovery (Caradoc through Wenlock). Our data consist of community lists of genera of the following groups: articulate and inarticulate brachiopods, trilobites, anthozoans, and bivalves. Community lists were compiled from a survey of the literature and supplemented by the Paleobiology Database (<http://www.paleodb.org/>).

Raw diversity curves show key differences between Laurentia and Baltica, with extinction intensity higher and the recovery more protracted in Baltica. When sampling standardization is performed, the curves diverge further. The Baltic curve continues to show a large drop in diversity at the extinction boundary and a protracted recovery, with diversity beginning to increase around 15 myr after the extinction. Diversity in Laurentia, however, remains flat or increases slightly through the time interval considered, despite the high extinction levels at the Ordovician-Silurian boundary. The Laurentian curve indicates a complete rebound in diversity to pre-extinction levels within 5 myr of the extinction. This suggests that the recovery in Baltica lagged behind that in Laurentia by around 10 myr. These data support the idea that the recovery in Laurentia was assisted by the immigration of Baltic taxa, implying the processes governing the rebound were different for the two regions.