The Toarcian Oceanic Anoxic Event: Impact on marine carbon cycle and ecosystems (IGCP-655)

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A better understanding of how the Earth System is reacting to past climatic upheavals is essential for predictions about the fate of life diversity and the future of our society. The International Geoscience Program (IGCP), a joint initiative of UNESCO and IUGS, serves as a knowledge hub to facilitate international scientific cooperation in geosciences. One of the strategical themes of the IGCP is Global Change: evidence from the geological record, which perfectly applies to the project IGCP-655, "Toarcian Oceanic Anoxic Event: Impact on marine carbon cycle and ecosystems".

The Toarcian Oceanic Anoxic Event (T-OAE, Early Jurassic, ~183MA) is considered as a past analogue for ongoing climatic changes. The T-OAE was characterised by an abrupt paleoenvironmental perturbation that included a global warming, a transgression coeval with a widespread deposition of black shales in many epicontinental basins, and a second-order mass extinction. A perturbation of the carbon cycle indicated by a negative carbon isotopic excursion has been documented in both marine and terrestrial material.

The IGCP-655 project (2017-2020) made advance our knowledge of the Toarcian Oceanic Anoxic Event as a result of a collaborative laboratory and fieldwork related to Pliensbachian to Toarcian successions located around the world. A major focus of the collaborative network is the understanding of the causes of the event, with special attention to the impact on marine communities and productivity, the perturbation of geochemical cycles, and the interpretation of environmental conditions and palaeoclimatic changes from geochemistry and fossil record. One of the main issues of this project is about the use of the term Jenkyns Event for characterising this early Toarcian global change that is not limited to an oceanic anoxic event. In fact, anoxia was not generalized and global change affected also emerged areas.

Key words: Jurassic, Jenkyns Event, Global Warming, Biotic Crisis

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