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Environmental magnetism of the Toarcian Oceanic Anoxic Event at Peniche (Portugal)

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The Pliensbachian-Toarcian section of Peniche has been recently selected as the global stratotype section and point for this time interval. It represents one of the best examples of the record of the oceanic anoxic event (OAE) in the world. Here we conducted a detailed a magnetostratigraphic and environmental study in order to improve the time-scale calibration and to provide new magnetic markers for period of oceanic anoxia recorded in marine sediments. Our results show that the magnetic signal is carried by very low coercive magnetic minerals and exhibit unstable and unreliable data for magnetostratigraphic investigation. In counterpart, bulk magnetic properties (magnetic susceptibility, isothermal remanent magnetization curves, etc) coupled to Scanning Electron Microscopy (SEM) show a striking negative correlation with carbonate content and 13DC previously published in the literature. Particularly, the most pronounced negative C isotopic composition of the OAE interval correlates with high magnetic susceptibility values. SEM-EDS analysis show that the strata featured by high MS values contain ubiquitous pyrite and greigite framboids. These insights provide new markers to identify the magnetic signature of OAE in the marine record.

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