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The OAE1a in the slope-to-basin settings of the Apulia Platform Margin (southern Italy): regional record of the global oceanic anoxic event

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The synthesises of the available data (planktonic foraminifera, calcareous nannofossils, stable isotopes) on the Aptian succession of the Gargano Promontory (southern Italy) provides the opportunity to shed light on the palaeoceanographic condition of this area during a time-interval characterised by global events such as the OAE1a. The promontory, located at the margin of the Apulia Platfom, peculiarly exposes carbonates of a Tethyan succession that accumulated in different depositional settings (slope to basin). Two distinct episodes of organic matter preservation are recorded in the

basinal successions but are not preserved in the proximal area. The older episode is equivalent to the Selli Event; the younger episode is estimated as occurring 500/600 kyr after the Selli Level equivalent. The occurrence of these two episodes of organic matter preservation during the Aptian is exclusive to the Gargano Promontory. Although the Selli Level equivalent contains sedimentological characters and distributions of relative abundances of microfossils (foraminifera, calcareous nannofossils, radiolarians) that have not been recorded elsewhere, some aspects, such as the carbon and oxygen isotope curves and the nannoconid crisis, mirror those recorded globally. The main difference is the moderate- rather than high-fertility condition of surface waters documented by the biotic record of this event.

OAE1a is a global perturbation linked to a warm, humid climate, strengthened by intense volcanic submarine activity that exacerbated greenhouse conditions. The increased input of nutrients, linked to intraplate volcanic activity and to an enhanced hydrological cycle, may have induced episodes of increased fertility of the surface-waters. Nevertheless, these episodes were not globally recorded, as testified by the

record in this portion of the Apulia Platform. Regional conditions of high productivity are in contrast recorded for the Upper Aptian black shale.

Our model highlights how, within a global climatic and palaeoceanographic context, different regional records of the same event can be produced, depending on the prevailing controlling factors. The Selli Level was the result of the co-occurrence of several mechanisms: according to the sedimentary and biotic record of the Gargano Promontory, the primary driving mechanism seems to have been stratification of the water-column related to the local palaeogeographic setting.