



Continental sedimentary response to acidity during the Early Triassic (Smithian-Spathian) in the westernmost Peri-Tethys.

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The Early Triassic was a time of extremely high temperatures, carbon cycle perturbations and widespread ocean anoxia. The continental sedimentary record of the westernmost Peri-Tethys realm, including E Iberia, Minorca and Sardinia Islands, offers a superb opportunity to examine the continental sedimentary response to the extreme conditions of the crisis interval at the Smithian-Spathian (S-S) transition. We here examine the Cañizar and Eslida formations and their lateral time-equivalent units in eight sections of the study area. These contain a wide range of facies mainly indicating alluvial, but also aeolian environments, and mostly including conglomerates, sandstones and siltstones. No signs of biotic activity such as palaeosols, flora, fauna and bioturbation were detected at the S-S transition. Despite the presence of redox proxies (pyrite framboids) and apparent high temperatures (widespread belt of aeolian facies), we attribute acidification processes a main role in severely restricting biotic activity in the study area from the late Smithian to late Spathian, before a transition to more oxygenated facies that record an oxic rebound through the presence of tetrapods, insects, plants, bioturbation and palaeosols.

Acidity was addressed by analyzing aluminium phosphate-sulphate (APS) minerals, and taking the concentrations of these minerals to reflect the intensity and duration of environmental acidification. This was done by developing a method to quantify APS concentrations in siliciclastic rocks based on electron microprobe techniques. This method emerged as a useful approach to understanding the S-S crisis interval in continental records.