

## An attempt to trace the redox state of the post Marinoan glaciation ( $\approx 635$ Ma) ocean at the Araras platform (Brazil)

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Oceans and atmosphere oxidation in the Ediacaran paved the way for one of the biggest evolutionary leaps in Earth's history – the dawn of animals. In an attempt to trace such a major oxidation event, we investigated carbonate layers deposited at the base of the Ediacaran period which cap Marinoan glacial deposits in central Brazil. The stratigraphic section in the Araras Group comprises 13 meters of pink dolostone overlain by 25 meters of gray limestone, separated by a transition zone of gray dolostone with higher organic carbon content. Well-preserved sedimentary structures along the section indicate a transgressive tract from shallow marine to deep water deposition environments. Applied redox proxies show two different oxidation states along the sedimentary column: oxic in the dolomitic part and dysoxic-anoxic in the limestone, suggesting that respective carbonates have formed in a redox stratified water column. In the transition zone between oxic and dysoxic-anoxic environments, nitrogen, vanadium, manganese, iron and sulfur show successive variations in their concentrations or isotopic compositions. These variations likely record the succession of nitrogenous, manganese, ferruginous and sulfidic zones, thus indicating a progressive upward transition from oxic to anoxic conditions. However, some geochemical proxies (e.g. Ce anomaly, Ni/Co) as well as the classical iron speciation redox indicator FeHR/FeT show contradictory results, providing thus conflicting interpretations for our dataset. We explain the different interpretations of the data in terms of either a paleo-redox state for the post Marinoan Ocean, or a diagenetic overprint.

## Metamorphic evolution recorded by amphiboles in the metadolerites from the Frido Unit ophiolites (Southern Apennine-Italy)

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Metadolerites of the Frido Unit Ophiolites have different kinds of texture reflecting various degree of *crystallinity*. Primary clinopyroxene is replaced by brown and green amphiboles interpreted as being of oceanic origin; brown amphiboles show Mg-hastingsite, edenite, pargasite, Fe-hastingsite, Mg-horneblende and tschermakite compositions, whereas green amphiboles show Mg-hastingsite, hastingsite, edenite, Mg-horneblende, tschermakite and Fe-tschermakite compositions. The blue amphibole rims of the brown amphibole has a winchite and barrowisite compositions; we infer that it crystallized during the early stages of the orogenic metamorphism, likely under static conditions. The different composition of amphiboles occurring in the metadolerites suggest that the ophiolitic rocks from the Frido Unit has been affected by both ocean-floor metamorphism in the amphibolite to greenschist facies conditions and subsequent orogenic metamorphism under HP/LT conditions.