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CAMP intrusive and extrusive activity and its influence on the end-Triassic mass extinction

Lucrezia Valeriani (1), Andrea Marzoli (1), Joshua Davies (2), Jacopo Dal Corso (3), Nereo Preto (1), Simonetta Cirilli (4), Eleonora Vasconcellos (5), Marcia Ernesto (6), Henrik Svensen (7), Nasser Youbi (8), Herve Bertrand (9), and Sara Callegaro (7)

(1) Padova University, Italy (andrea.marzoli@unipd.it), (2) Geneva University, CH, (3) University of Leeds, UK, (4) Perugia University, Italy, (5) Parana University, Brazil, (6) IAG-USP, Sao Paulo, Brazil, (7) CEED, University of Oslo, Norway, (8) Caddy Ayyad University, Marrakech, Morocco, (9) ENS-Lyon, France

The end-Triassic environmental changes and mass extinction was marked by three main carbon isotopic excursions (CIEs). Based on stratigraphic and geochronologic data, we show that the earliest CAMP intrusions were emplaced at ca. 201.6 Ma prior to the first CIE (Davies et al., 2017). The main phase of CAMP magmatism started just prior to the first CIE at ca. 201.5 Ma and continued until the second CIE and the Triassic-Jurassic boundary (at ca. 201.3 Ma). In particular, intrusion of the over 1 million cubic km of basaltic sills in Amazonia (Brazil) and of widespread sills from North America and Africa occurred within this interval. Multidisciplinary analyses show that organic matter rich sediments close to the sills from Brazil, Morocco, and the USA underwent contact metamorphism and organic carbon depletion. Such process may have released large amounts of thermogenic gases (CO_2 and CH4) leading to global perturbation of the carbon cycle and to global warming.
The timing of CAMP volcanic eruptions is well constrained by combined geochronologic, stratigraphic and palynologic data. In Morocco, newly observed palynological assemblages for sediments at the top of the lava piles are nearly identical to those found at the base of the volcanic sequences. These new data combined with carbon isotopic data indicate that over 95% of the CAMP lava flows in Morocco erupted during a short time interval (< 140 Ky)during the end-Triassic extinction interval. CAMP basalts are quite sulfur rich (up to 1800 ppm) suggesting that CAMP eruptions emitted large amounts of SO_2. Such emissions lead possibly to short-lived cooling events.

Davies J. et al. (2017). End-Triassic mass extinction started by intrusive CAMP activity. Nature Communications, doi: 10.1038/NCOMMS15596.