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- IX SIMPÓSIO DE VULCANISMO E AMBIENTES ASSOCIADOS
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- II WORKSHOP ARMAZENAMENTO DE CO₂ POR MINERALIZAÇÃO EM BASALTOS
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High-precision geochronology constraints on the duration of mafic intrusive high-Ti-Sr magmatism of the Paraná Magmatic Province, Brazil

Rocha, B.C.¹, Gaynor, S.P.², Janasi, V.A.¹, Davies, J.H.F.L.³, Florisbal, L. M.⁴, Waichel, B.L.⁴, Polito, M.Z.¹, Lino, L.M.¹, Perrot, M.G.⁵, Schaltegger, U.⁶

¹ Departamento de Mineralogia e Geotectônica/Instituto de Geociências/Universidade de São Paulo, São Paulo - SP, Brasil, brenda.rocha@usp.br, vajanasi@usp.br, marianezp@usp.br, lucas.martins.santos@usp.br; ² Geology, Geophysics, and Geochemistry (G3) Science Center/United States Geological Survey, Denver - CO, USA, sgaynor@usgs.gov; ³ Département des Sciences de la Terre et de l'atmosphère/Geotop/Université du Québec a Montréal, Montreal – QC, Canada, davies.joshua@uqam.ca; ⁴ Programa de Pós-graduação em Geologia/Universidade Federal de Santa Catarina, Florianópolis - SC, Brasil, luana.florisbal@ufsc.br, breno@cfh.ufsc.br; ⁵ Department of Earth and Planetary Sciences/McGill University, Montreal -QC, Canada, morgann.perrot@mcgill.ca; ⁶ Département des Sciences de la Terre/Université de Genève, Geneva, Switzerland, Urs.schaltegger@unige.ch

The global environmental impact of Large Igneous Province (LIP) magmatism is commonly interpreted as the result of volcanogenic gas release and production of thermogenic gases from contact metamorphism of mafic magmas emplaced in volatile-rich sediments. Links between specific LIPs and discrete global environmental changes can only be established through high-precision geochronology which provides the necessary analytical precision and accuracy to temporally resolve the timescales of LIP magmatism and of global climate change. The temporal correlation between the Paraná-Etendeka LIP magmatism and the ca. 135 Ma Valanginian Event, a minor oceanic anoxic event (OAE) (Martinez et al., 2015), is increasingly under question. High-precision zircon single-grain CA-ID-TIMS ages indicate low-Ti silicic volcanism occurred at ca. 133.6 Ma, erupting for approximately 700 kyr. These silicic rocks are stratigraphically interlaid within the earliest low-Ti basalts; these mafic lavas postdate the Valanginian Event and could not have caused it (Rocha et al., 2020). However, the emplacement of potentially diachronous mafic magmas into volatile-rich sediments could have contributed to thermogenic gas release and been drivers of the Valanginian Event. New baddeleyite U-Pb ID-TIMS ages from high-Ti-Sr mafic intrusive rocks yielded an age of ca. 132 Ma (Rocha et al., 2023), either equivalent within uncertainty or younger than previous estimates for the Florianópolis Dyke Swarm, too young to correlate with global climate perturbations during the Valanginian. However, these baddeleyite ages overlap with a new CA-ID-TIMS U-Pb zircon crystallization age from a mafic sill from the high-Ti Parapanema type, which is the uppermost stratigraphic unit of the province, providing a potential final age for magmatism associated with the Paraná-Etendeka LIP. These new ages suggest a duration of ca. 2 Myr for the intrusive activity of high-Ti-Sr and high-Ti magmas in the Southern and Northern Paraná LIP, respectively, and further indicate that the Paraná LIP magmatism postdated the Valanginian Event and the two events were unrelated.

Keywords: baddeleyite U-Pb, Urubici magma-type, Florianópolis Dyke Swarm, Paraná-Etendeka LIP, Valanginian Event

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