Update of the cover of the Piedra Alta Terrane (Uruguay): Geochronology

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The western cratonic area of the Rio de la Plata craton in Uruguay was defined as Piedra Alta Terrane. It is constituted dominantly by Paleoproterozoic gneissic-migmatitic rocks with intercalations of two volcano-sedimentary belts of varied metamorphic grade. Granites, granodiorites and mafic bodies intrude this unit. The last igneous manifestation is characterised by a conspicuous basic dyke swarm with ages around 1.75 Ga and another one represented by lamprophyric dikes with Ar/Ar ages of 1.42 Ga. The volcano-sedimentary belts are San José and Arroyo Grande belts. Associated with them, is recognised a granitic-gneissic complex and related migmatites with magmatic intrusives emplaced at different crustal levels. The Arroyo Grande Belt (AGB) is located in the NW limit of the Piedra Alta Terrane. Different plutons with ages ranging from 2.05 to 2.10 intrude this belt. The main area of metamorphic rocks shows an EW trend and it extends from Paso de Lugo in the west to some kilometres to the east of Arroyo Malo del Yí. Some primary sedimentary structures are preserved in the metasediments (e.g.,crossed stratification) suggesting that the base of the series is towards the north. The detritic rocks predominate near the base of the sequence, whereas varied amphibolites are in the top. Basic metavolcanic rocks predominate throughout the south border of the belt. Towards the east, the detritic sequence has been intruded by several granitoids showing mylonitic contacts. The U-Pb detrital zircon ages of all three samples from Arroyo Grande Fm indicate a sharp peak ranging from 2.06 to 2.25 Ga. This interval is in good agreement with the available ages for the basement and intrusive granites.

This scenario demonstrates a very short interval for basement formation and erosion, deposition of volcanosedimentary sequences, deformation and metamorphism of these units and subsequent intrusion of the granitoids that cut them.

New data from San José Belt (basement, Cerros San Juan and Montevideo Formations) were obtained. The basement of Montevideo Formation shows U-Pb ages ranging from 2.3 to 1.8 Ga with very little Archean inheritance. Around 1.75 these rocks were affected by the extensional event of Florida dikes. On the other hand, the Montevideo Formation shows ages from 2.0 to 1.1 Ga, with two peaks in 1.7 and 1.4, consistent with the ages of Florida dikes and recently dated lamprophyric dikes in 1.42 Ga.

Although more data is needed, the Archaean heritage might question whether the RPC is indeed an entirely juvenile Paleoproterozoic unit.