

GONDWANA 15
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ABSTRACTS
BOOK

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The geological setting of Carboniferous magmatism in the proto-Andean margin of Gondwana, Sierra Pampeanas, Argentina

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Our petrogenetic understanding of the Carboniferous granites of the Sierras Pampeanas has improved in recent years, but their geodynamic setting is still not well constrained. Domeier and Torsvik (2014) affirm that there is no documented and unambiguous evidence of an active margin in the proto-Andean margin of Gondwana before the late Carboniferous (~320 Ma). Recently, Willner et al. (2011) postulated Middle–Late Devonian collision of a hypothetical microplate (*Chilenia*) and the subsequent emplacement of Early Carboniferous (~340 Ma) post-collisional granites in the Cordillera Frontal, although granites with such post-collisional signature remain unproven. However, recent studies in the Eastern Sierras Pampeanas (e.g., Alasino et al. 2012, Dahlquist et al. 2010, 2013) have shown that the Early Carboniferous granites are typical of metaluminous A-type magmatism (intraplate) with participation of both juvenile material and continental crust in the source. Work in course shows that peraluminous A-type granites were also emplaced in the same geodynamic setting (e.g., La Costa pluton, Alasino et al., 2012, 360 ± 3 Ma unpublished). Conversely, recently studied Early Carboniferous granites in the Western Sierras Pampeanas and Cordillera Frontal (ranging from 341 ± 2 to 321 ± 2 Ma, unpublished) show juvenile calc-alkaline characteristics (e.g., Alasino et al. 2012 and unpublished data). Our new geochemical and geochronological data support the presence of a magmatic arc from the Early Carboniferous, located in the western margin of Gondwana (i.e., present-day Cordillera Frontal and Western Sierras Pampeanas) with the synchronous development of A-type magmatism in the foreland region (now the Eastern Sierras Pampeanas). Any geodynamic setting for Carboniferous time must include the presence of both a magmatic arc and intraplate magmatism. A simple collision during the Middle–Late Devonian with subsequent cessation of magmatism during the Early Carboniferous is irreconcilable with our data.

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