



MAGM-1: Arcos magmáticos fanerozoicos

The Famatinian cordilleran magmatism in southern South America resulting from lithosphere reworking?

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Along the proto-Pacific margin of Gondwana, from Venezuela to northeastern Patagonia, the Early–Middle Ordovician Famatinian orogeny was the first orogenic event following assembly of the supercontinent. Magmatism is mostly restricted to the interval 463 ± 4 to 486 ± 7 Ma, with the most intense period of emplacement between 468 and 472 Ma constituting a magmatic flare-up. Granitoid emplacement in both northeastern Patagonia and the Cordon de Lila (Puna Altiplano, Chile) was effectively synchronous with that in the Sierras Pampeanas, defining a continuous belt. Combined geochemical and isotopic data (whole-rock Sr, Nd; Hf, O in zircon) indicate that the source of calcic metaluminous suites is the subcontinental lithosphere –both mantle and mafic lower crust– with variable contamination by the Early Paleozoic metasedimentary country rocks. The lithospheric mantle involved is assumed to underlie the outcropping 1330–1030 Ma Grenville-age basement of the Western Domain, which exhibits tectonic characteristics of active continental margin in the north and oceanic arc-back arc in the south. The latter sector is the potential source of some minor Famatinian igneous rocks with less evolved isotopic compositions, although a restricted asthenospheric addition cannot be discarded in this case. Minor peraluminous granites are spatially associated with the metaluminous sequence, but major highly peraluminous batholiths occur on the eastern flank of the Central Domain. Field relations and geochemical/isotopic evidence indicate that the most obvious source of these crustal melts was the very thick post-early Cambrian metasedimentary sequence comprising the host country rocks. Although asthenospheric mantle was a necessary heat source for lithospheric melting, its material contribution to the growth of Early Paleozoic crust was apparently very minor. Recycling of Mesoproterozoic lithosphere, including the subcontinental mantle, coupled with crustal melting of Early Paleozoic metasedimentary sequences, accounts for most of the Famatinian orogenic magmatism. Consistent results from the Central Andes and East Antarctica confirm that the early stages of the Terra Australis orogen in SW Gondwana were dominated by lithospheric reworking processes.