

Permian to Jurassic record of subduction related extension and compression in the Central Cordillera of Colombia

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The final assembly of Pangea, its break-up and the further plate reorganization that triggered a continuous subduction zone in the northwestern margin of South America during the Jurassic, are events represented in the Central Cordillera of the Colombian Andes by a diverse rock record. Despite the increasing number of U-Pb crystallization ages recently published, the role and the relationships between these different groups of Permian to Jurassic rocks and their bearing on the configuration of the western margin of Pangea remains elusive.

The south-central segment of the Central Cordillera of Colombia includes representative lithologies from all these events. Calc-alkaline granitoids (ca. 280 Ma) may represent a permian magmatic arc not well defined due to limited exposures, but with crystallization ages comparable to the El Baul in Venezuela. A key relationship is defined by orthogneisses (ca. 270 Ma) intruded by amphibolites (ca. 230 Ma) that share the same foliation direction (N15°E). This suggests that both rocks were affected by the same post to syn-Triassic metamorphic event. Finally, a well established magmatic arc produced granitic batholiths that intrude the Permian to Triassic rocks. The history of this magmatic belt lasted from ca. 190 to 130 Ma, and probably ended due to an extreme obliqueness in the convergence between the Farallon plate and north western South America. Coeval to this, is the medium P/T Jurassic metamorphic belt (Cajamarca Complex), located to the west of the Jurassic batholiths. Its metamorphic ages are similar to the crystallization ages reported in deformed granitoids that are part of the Jurassic magmatic belt. This probably means that the collisional metamorphic event that produced the Cajamarca Complex during the Jurassic was related with the syn-tectonic intrusion of middle Jurassic magmatic pulses. This may have imprinted the deformation pattern seen in the metamorphic Permo-Triassic basement of the Central Cordillera. The Permian calc-alkaline granitoids were not affected by deformation, and are related with the earliest pulses of the Jurassic magmatic belt (Ibagué Batholith), suggesting that the Jurassic metamorphic event was spatially restricted, probably linked to along strike variations in the tectonic configuration of the margin.