



SHRIMP U-Pb zircon geochronology of Mesozoic granitoids from the Bariloche region (Argentina): Implications for the Middle-Late Jurassic evolution of the North Patagonian batholith.

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A detailed U-Pb geochronological study has been carried out on granitoids of the North Patagonian batholith in the region of Bariloche (Argentina), between $40^{\circ}30' S$ and $41^{\circ}45' S$. In this region, the calc-alkaline, subduction-related, granitic bodies of the North Patagonian batholith intruded an Early Jurassic volcano-sedimentary sequence contemporary with the intrusion of the Subcordilleran Patagonian batholith (J1 magmatism), and unconformably overlying a metamorphic Gondwanan basement. All these rocks were affected by the Andean compressional phases during the Cenozoic. U-Pb SHRIMP dating of zircon crystals from 11 samples (109 spots) of diorites, tonalites, granodiorites and granites yielded dates ranging from 173 ± 3 Ma to 150 ± 2 Ma (Aalenian to Tithonian). No significant age differences have been identified among the distinct lithological types. Also no spatial trend emerges from these results, although ages tend to be younger westward in the traverse of the Manso River ($\approx 41^{\circ} 35' S$). Two peaks appear in the probability density plot of zircon ages. Most of the dated zircons are Bajocian-Bathonian (Middle Jurassic, ≈ 169 Ma, J2 magmatism), while a secondary peak is observed at the boundary Oxfordian-Kimmeridgian (Late Jurassic, ≈ 156 Ma, J3 magmatism). The J2 magmatic period is coeval to the main stage of effusive activity (V2) in the huge volcanic Chon Aike Province, while J3 coincides with the lesser V3 period of volcanism in Chon Aike. These new geochronological data strongly contribute to the knowledge of the first stages of tectonic evolution of the Andean subduction margin in southern South America. Contrary to previous models, it can be proposed that the subduction-related Mesozoic magmatism started well before the Late Jurassic, and that a continuous supply of calc-alkaline magmas dominated the active margin of South America during at least 190 Ma, from the Early Jurassic to nowadays. Therefore, no dramatic time gap can be observed between the Subcordilleran Patagonian batholith and the North Patagonian batholith at the studied area. On the other side, the close age relationship between the North Patagonian batholith and the volcanic rocks of the Chon Aike Province, that, according to previous studies, shows a strong subduction-related geochemical affinity for the V2 and V3 episodes, opens new ways to decipher this poorly known period of Andean subduction and to evaluate the petrogenetical links between plutonic and volcanic rocks in active continental margins.