

The diachronous onset of the magmatic stages during the Paleozoic and Mesozoic in the Andean forearc at 24-27°S

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The evolution of the magmatism and the magmatic arc migrations in the northern Chile is well known thanks the available geological records of Gondwanide, Pre-Andean (Permo-Triassic), and Andean igneous rocks (e.g. Coira et al., 1982; Parada et al., 2007; Maksaev et al., 2014; Oliveros et al., 2018). The advances on the geological cartography and the U-Pb dating during the last decade have been made available new geochronological data. The available U-Pb ages can help to precise the age of the main magmatic stages and the distribution of the successive magmatic belts in the Andean forearc. In this context, we compiled 1,489 individual zircons ages from 110 U-Pb dating of Paleozoic and Mesozoic rocks of the Andean forearc between 24-27°S published in the geological cartography and scientific papers. In this work, we present the preliminary results of the statistical analysis of this geochronological database to precise the absolute ages of the magmatic activity in this segment, considering the distribution in the present-day physiographic units. We recognize the well-established main magmatic periods related to the Famatinian (Late Cambrian-Early Silurian), Gondwanide (Late Mississippian-Early Permian), Pre-Andean (Middle Permian-Late Triassic) and Andean cycles (since Late Triassic). Our results show the onset of the magmatism in each stage was diachronous in accordance with the present-day physiographic units. Also, the inherited individual zircons can be related to Transamazonian, Sunsas-Grenville and Brazilian orogenies. In this line, the Gondwanide magmatism began at 328, 310 and 285 Ma in the Precordillera, Central Depression and Coastal Cordillera, respectively. Similarly, the Pre-Andean magmatism began at 270, 262 and 256 Ma in the Puna, Precordillera, and Coastal Cordillera, respectively. Subsequently, the onset of Andean magmatism occurred at 214-217 Ma in the present-day Coastal Cordillera and the Precordillera. The Andean magmatism was located in the Coastal Cordillera until 87 Ma and migrated eastward to the 72, 81 to the Central Depressión and the Precordillera, respectively. Our result show the regional-scale analysis of the U-Pb geochronology is an opportunity to understand the evolution of the magmatism involved in the construction of the Andean forearc.

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