Blueschist facies conditions in Tethyan passive margin metabasaltic rocks of the easternmost Lower Alpujarride Units (Internal Betic Zone, Spain)

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Jurassic shallow-intrusive basic bodies within the Permian-Triassic Tethyan passive margin sedimentary sequences of the Lower Alpujarride units (Internal Betic Zone, Spain) locally show Alpine low-grade metamorphism in the greenschist and blueschist facies. A small sill-like mafic body near Redován town (Callosa Range) partially preserves igneous ophitic/subophitic texture and relics of augite, ferrohornblende-ferroedenite, kaersutite and K-feldspar (orthoclase). The metamorphic overprint corresponds to high-pressure and low-temperature mineral assemblages that comprise magnesioriebeckite, actinolite, albite, stilpnomelane, phengite and chlorite, with rutile, apatite and titanite as accessory minerals. Major and trace element geochemical data reveal igneous protoliths derived from magmas of alkaline basalt composition enriched in incompatible elements and E-MORB geochemical affinity. The intrusion emplacement occurred at shallow crustal levels in an extensional geodynamic setting (within-plate basalts) related to the breakoff of Pangea. Pressure-Temperature (P-T) conditions estimated by means of pseudosection calculations and the intersection of phengite (Si) and chlorite (Mg#) isopleths indicate a cold thermal gradient with calculated peak metamorphic conditions of ca. 8 kbar at 310 ºC. These conditions are consistent with metamorphism during burial down to ca. 24 km depth and a thermal gradient of ca. 13 ºC/km. Although the easternmost Lower Alpujarride units have been traditionally described as reaching only lower-greenschist to greenschist metamorphic peak conditions, the textures, mineral compositions and P-T conditions of the studied metagabbroic body reveal blueschist facies conditions that attest for a regional early stage (Eocene) of subduction of the lower Alpujarride units. This event predates the late Oligocene - early Miocene subduction-related metamorphism of the Intermediate and Upper Alpujarride units.