

Amphibolite-Granulite facies metamorphism at the base of island arcs: Clues from Calaton Hill, Tablas island, Philippines

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The Philippine island arc system preserve records of multiple orogenic events throughout its history. In particular, the rifting and drifting of the Palawan-Mindoro Microcontinental block from mainland Asia and its subsequent collision with the Philippine Mobile Belt likely caused the exhumation of oceanic lithosphere fragments in western Philippines and the regional metamorphism in the area. Uncertainties still abound however on the exact location of this arc-continent collision zone and its timing relative to other tectonic events in the region (e.g. arc magmatism, opening of the South China Sea Basin). Detailed estimation of the pressure-temperature-deformation-time (P - T - D - t) history of the different metamorphic units in the region which are required in order to link these metamorphic rocks with each other and to the PMB-PCB collision are also lacking. In Tablas island of the Romblon Island Group, earlier studies identified at least two distinct stages of metamorphism: a prevalent greenschist to amphibolite facies event recorded in most Romblon metamorphic rocks, and a higher T amphibolite-granulite facies metamorphism preserved in the southeast section of the island in Calaton Hill. In this work, we present new field and petrological data from exposures in and around Calaton Hill. Calaton Hill is mainly composed of gabbros and pyroxenite-hornblendites thought to represent the base of an ancient arc. Samples from the area revealed both unmetamorphosed, i.e. with cumulate texture, and highly foliated gabbroic-ultramafic lithologies. The lithologies comprise varying amounts of olivine, clino- and orthopyroxenes, plagioclase and hornblende with the metamorphosed variety only exhibiting grain size reduction and foliation. The surrounding paraschists in Calaton Hill meanwhile are composed of aluminosilicates, biotite, quartz, and alkali feldspar. These assemblages suggest high T metamorphism in SE Tablas island.

Keywords: Calaton Hill, Tablas, Romblon Metamorphic rocks, Amphibolite and granulite facies