



Birth and demise of subduction in the northern margin of the Caribbean plate (Cuba)

A. García-Casco (1), M.A. Iturralde-Vinent (2), K. Nuñez Cambra (3), R.L.Torres-Roldán (2), G. Millán (3), C. Lázaro Calisalvo (1) and A. Rodríguez Vega (4)

(1) Departamento de Mineralogía y Petrología, Universidad de Granada, Fuentenueva s/n, 18002 Granada, Spain (agcasco@ugr.es), (2) Museo Nacional de Historia Natural, Obispo no. 61, Plaza de Armas, La Habana 10100, Cuba, (3) Instituto de Geología y Paleontología, Vía Blanca y Carretera Central, La Habana, Cuba, (4) Instituto Superior Minero-Metalúrgico, Departamento de Geología, Las Coloradas de Moa, Holguín, Cuba.

P-T-t paths of high-pressure blocks from serpentinite mélanges all through Cuba allow inferring birth and demise events of subduction in this sector of the northern margin of the Caribbean plate during the Cretaceous. Three events, that may or may not have taken place along strike of the same subduction zone, are identified. The earliest event is recorded in Western and Central Cuba, where HP blocks within serpentinite mélanges indicate demise of a mature (cold) subduction zone during the Aptian-Albian (103-118 Ma). The P-T evolutions of the blocks are clockwise, with subtle changes in P-T during the prograde sections and relatively hot geothermal gradient during exhumation (“Alpine-type”) incompatible with steady-state subduction. Petrological arguments and correlation with Guatemalan blocks of eclogite favor an Aptian-Albian intra-oceanic collision setting that caused arrest of NE-directed subduction of Pacific lithosphere. In contrast, HP blocks of garnet amphibolite within serpentinite mélanges from Eastern Cuba document the birth of a subduction zone during the Aptian-Albian (ca. 110 Ma). The P-T paths followed are counterclockwise, with hot prograde sections (on-going subduction) and cold retrograde sections indicating syn-subduction exhumation and refrigeration of the subduction system. Blocks of blueschist from these mélanges document establishment of cold (mature) subduction during the Upper Cretaceous, and termination of subduction during the Late Campanian-Maastrichtian. SW-dipping subduction of the Proto-Caribbean is proposed, though geological and structural data indicate a complex arrangement of

subduction systems in Eastern Cuba during the Upper Cretaceous. Finally, HP ophiolitic material tectonically juxtaposed within subducted platform metasediments of the Escambray complex (Central Cuba) document the demise of a mature (cold) subduction zone during the uppermost Cretaceous. The P-T paths include cold retrograde sections indicating syn-subduction exhumation (“Franciscan-type”) at ca. 70 Ma and ensuing arrest of subduction upon impingement of the continental margin.