Geological Soceity of America Abstracts, v. 35, no. 4, p. 75

TWO BELTS OF JADEITITE AND OTHER HIGH-PRESSURE ROCKS IN SERPENTINITES, MOTAGUA FAULT ZONE, GUATEMALA

V.B. Sisson, G.E. Harlow, H.G. Avé Lallemant, S. Hemming, S.S. Sorensen

The Motagua River of Guatemala follows the present plate boundary zone (PBZ) between the North American (Maya Block) and Caribbean plates (Chortís Block). The central portion of the Motagua River Valley is bordered by E-W striking tectonic slices of serpentinite, some of which contain blocks of high P/T rocks, including eclogites, amphibolites, and jadeitites. Previously, this has been interpreted as a single ophiolite complex – El Tambor Group. However, the sheeted dikes and gabbros of a complete ophiolite are rare, and the units are strongly dismembered. Metamorphosed basaltic rocks (prehnite-pumpellyite facies and, in cases, actinolite-bearing), radiolarian cherts, and greywackes occur sporadically within fault slices of the El Tambor Group.

Recent exploration for commercial jadeitite – jade – has revealed large quantities in serpentinite bodies farther from the river; there is a far greater areal distribution of jadeitite than previously recognized. The southern bodies, adjacent to Chortís basement, also contain abundant eclogite, glaucophane eclogite, blueschist, and other high P/T rocks. The northern bodies, adjacent to Maya basement, include abundant jadeitite, albitite, and amphibolite but rare eclogite. Our initial studies find metasomatic signatures in most of the high-P/T rocks and mineralogical differences between the northern and southern jadeitites. Preliminary Ar/Ar dating of phengite consistently shows the northern rocks with 65-77 Ma ages and southern with 116-125 Ma ages; surprisingly, two high P/T events are evident. These dates would suggest the El Tambor Group is actually comprised of some combination of ophiolite and two sets of exhumed serpentinite, the older one emplaced into the Chortís block and the younger into the Maya block. The southern belt may record collision of the Chortís block with Mexico. This suite was exhumed during by transpression and left lateral strike-slip faulting along the ancestral MFZ. The younger ages in the Maya block probably reflect subduction of the Chortís block during closure of a back arc basin; the back arc basin is now represented as the Santa Cruz and other ophiolite belts. Thus, MFZ contains two high-pressure belts with different exhumation histories in the PBZ in Guatemala.

KEYWORDS: Motagua Fault zone, jadeitite, high-pressure metamorphism, subduction zone, Caribbean, Ar-Ar geochronology