Geophysical Research Abstracts, Vol. 7, 05965, 2005
SRef-ID: 1607-7962/gra/EGU05-A-05965

Timing of Cretaceous island arc magmatism in Cuba as revealed by U-Pb SHRIMP zircon dating

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U-Pb SHRIMP zircon dating on eleven intrusive rocks from Central Cuba (Villa Clara to Camagüey) place temporal constraints on the evolution of the Cretaceous volcanic arc system in Cuba, the largest of the Caribbean islands. Three different Cretaceous island arc systems are recognized in Cuba, namely two pre-Albian arcs (>112 Ma) and another arc system dated as Albian to Campanian (ca.112-71 Ma; Iturralde-Vinent, 1998). We dated zircons from six granitoid rocks from the Manicaragua-Mabujina area and one plagiogranite sample from the ophiolite belt near Santa Clara. A foliated folded granodioritic orthogneiss emplaced into Mabujina amphibolite from the Jicaya River yielded a 206Pb/238U emplacement age of 132.9+/-1.4 Ma which reflects an early episode of arc magmatism possibly related to formation of a pre-Albian "primitive island arc" described from Cuba, Puerto Rico and the Dominican Republic (Iturralde-Vinent, 1998). The other samples, also from the Mabujina belt, provided 206Pb/238U emplacement ages between 92.8+/-0.7 Ma and 83.1+/-0.8 Ma. These ages are related to calc-alkaline Turonian-Campanian magmatism, suggesting a continuous magmatic evolution through about 10 m.y. The plagiogranite from the ophiolite belt provided an age of 85.9+/-0.6 Ma, similar to an 40Ar/39Ar amphibole plateau age (88+/-3.2 Ma) for metabasalt of the same belt but more to the east (Iguará-Perea; García-Casco et al., 2003). These ages establish the ophiolite to have formed in the Coniacian. We also analyzed four granitoids from the Camagüey batholith, and these yielded 206Pb/238U emplacement ages between 104.0+/-2.0 Ma and 81.2+/-1.4 Ma, reflecting a 20 m.y. period of arc magmatism. One sample from Florida locality con-

tained a 445 Ma zircon xenocryst, suggesting involvement of older crust in the production of this batholith. Single-step fusion 40Ar/39Ar hornblende and biotite ages from the same rock types (96-97 Ma; P. Renne, quoted in Hall et al., 2004) suggest fast initial uplift and cooling of the batholith, whereas K-felspar and biotite total gas Ar/Ar ages of 80 and 71-72 Ma respectively reflect a different and slower cooling history, probably related to tectonic unroofing (Hall et al., 2004). Our age data suggest continuous granitoid magmatism in central Cuba between ca.104 and 81 Ma, supporting previous conclusions by Somin and Millán (1981) and Bibikova et al. (1988), whereas the older age of 132 Ma may reflect early Cretaceous magmatism related with formation of the so-called Caribbean primitive island arc.

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