STRATIGRAPHIC REVISION OF THE MID-CRETACEOUS TOBAGO VOLCANIC GROUP, TOBAGO, WEST INDIES

Snoke, A.W.[1], Noble, P.J.[2] and Cobban, W.A.[3]
[1]Department of Geology and Geophysics, University of Wyoming,
Laramie, WY 82071-3006, U.S.A.
[2]Department of Geology, California State University, Sacramento,
CA 95819-6043, U.S.A.
[3]U.S. Geological Survey, Denver, CO 80225, U.S.A.

ABSTRACT

Geologic mapping, coupled with paleontological and radiometric determinations, significant stratigraphic revisions of Maxwell's (1948) Tobago Volcanic Grou required. Similar lithotypes occur in several of Maxwell's "formations", making his original designations difficult to apply in mapping. Although a large part of the TVG remains "undifferentiated", we recognize three formally named, mappable units: Argyle Formation (oldest), Goldsborough Formation, and Bacolet Formation (youngest). Additionally, various epiclastic units occur locally throughout the TVG.

An unusually fossiliferous epiclastic sequence is exposed near Scarborough, Tobago. It occurs above an undifferentiated sequence of volcaniclastic breccia and lava and in turn is overlain by the Bacolet Formation. This particular epiclastic unit contains two ammonite-bearing localities and the best-preserved radiolarians known from the TVG. Natural molds of ammonites from the Spring Gardens quarry are moderately evolute with unbranched ribs; probably they are juveniles of Majsisovicsia of middle Albian age. Another ammonite mold from a stratigraphically higher locality in the same epiclastic unit is identified as Manuaniceras decsernae Young, probably of early late Albian age. The radiolarian assemblage from epiclastic intervals of the TVG is characterized by abundant Archaeospongoprunum spp., and the common occurrence of Pseudodictyomitra pantacolensis, Archaeodictyomitra vulgaris, and an undescribed species of Pantanellium. Present in lesser abundances are other members of the Archaeodictyomitridae, Xitus, Ultranapora durhami, and fragments of a nesosciadiocapsid, which may be Petasiforma. This assemblage is correlated with the uppermost part of zone 6 through zone 7 as found in California's Coast Ranges (Pessagno, 1977), calibrated as latest Aptian through early late Albian.

Hornblende from a lithic clast in tuff breccia (Little Tobago island) has yielded an $^{40}Ar/^{39}Ar$ plateau age of 104.2±1.3 Ma (Snoke et al, 1990), corresponding to the eruptive age of the enclosing volcaniclastic strata. These data, coupled with the paleontological determinations, indicate an Albian age for the TVG. Correlation of the TVG with other mid-Cretaceous volcanic sequences in the southern Caribbean is problematic because of the complex stratigraphic and structural framework of the region. Nevertheless, possible correlatives include the Tiara Formation of Venezuela and the lower half of the Washikemba Formation of Bonaire.