BIOSTRATIGRAPHY, DEPOSITIONAL ENVIRONMENTS, AND DIAGENESIS OF THE TAMANA FORMATION, TRINIDAD

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ABSTRACT

The Tamana Formation of the Central Range of Trinidad was studied in order to determine its importance in the stratigraphical and structural development of north-eastern South America. Biostratigraphical, petrological and mineralogical data, combined with field mapping show that the Tamana sediments are composed of five distinct lithofacies: inner to outer shelf, burrowed shaley mudstone; outer shelf, Fe-rich sandy limestone; submarine channel, conglomeratic mudstone; middle shelf to nearshore, algal-foram packstone/grainstone; and intertidal to nearshore, algal-stromatolite-coral boundstone with coral bioherms. Maximum thickness of the Tamana Formation is 244 m.

Deposition of the Tamana limestones occurred between the Praeorbulina glomerosa (latest early Miocene) and Globorotalia fohsi robusta (middle part of the middle Miocene) planktonic foraminiferal zones, and in a more continuous trend than is seen in the current outcrop belt. Detailed biostratigraphy shows that the Tamana Formation is a facies equivalent of the shallow and deep water shales of the Brasso Formation, and the deep water turbidites of the Herrera Member of the Cipero Formation.

The early diagenetic history of the Tamana limestones was dominated by the precipitation of authigenic glauconitic smectite, and the dissolution of skeletal grains and carbonate matrix. Late burial diagenesis was dominated by the precipitation of illite and illite/smectite. Comparative mineralogy and textural analyses indicate a minimum range of burial depth for the Tamana Formation of 800-1500 m, with a maximum of 2400 m. Alteration of Fe-bearing minerals to goethite and late fracturing occurred during post-Pliocene tectonic uplift and unroofing of the Central Range.