Contrasting Ichnologic Signatures of Wave-Dominated Deltaic and Non-Deltaic Shallow-Marine Deposits in the Miocene Carapita and Capaya Formations, Tacata Field, Eastern Venezuela

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Integrated ichnologic, sedimentologic, sequence stratigraphic and micropaleontologic analysis of cores from the Lower Miocene Carapita Formation and the Middle Miocene Capaya Formation (Tacata Field, eastern Venezuela) allows delineating deltaic and non-deltaic deposits in the subsurface. Sandstone wedges in these formations record progradation of a wave-dominated deltaic complex where periodic fluvial discharges alternated with storm events and suspension fallout in the delta front and prodelta. Tidal evidence is detected in the distributary plain. Deltaic facies grade vertically and laterally into non-deltaic nearshore deposits. Degree of bioturbation ranges from low to moderate in deltaic deposits. Prodelta and distal delta front deposits are dominated by Phycosiphon and Chondrites, commonly occurring as monospecific suites. Other components are Terebellina, Arenicolites, Palaeophycus, Teichichnus, Planolites and escape traces. Vertical Ophiomorpha, Thalassinoides and Planolites are dominant in delta front deposits; Terebellina, Phycosiphon, Palaeophycus, Teichichnus and Planolites are subordinate components. Distributary channel deposits contain Ophiomorpha and Skolithos. Planolites, Palaeophycus and root traces are the most common forms in interdistributary bay deposits. Large and deep synaeresis cracks and soft-sediment deformation structures are very common. Low ichnodiversity of individual suites reveals a stress factor due to reduced salinity and allows distinction from nondeltaic strandplain shoreface successions. However, the dominance of Phycosiphon, Terebellina and Chondrites suggests periods of normal marine salinity that alternated with dilution due to fluvial discharge. Non-deltaic deposits are commonly more intensely bioturbated and display an increase in ichnodiversity. In particular, the echinoid trail Scolicia is restricted to offshore deposits lacking any evidence of associated fluvial discharge, revealing normal marine salinity. Ichnologic data are extremely valuable to detect fluvial inputs in shallow marine clastic seas.