

## High Resolution Benthic Foraminiferal Ecostratigraphy of the Ciperó Formation, Trinidad

Sadie Samsóondar<sup>1</sup>, Jenai Valadere<sup>1</sup>, Brent Wilson<sup>1</sup>, Karuna Moonan<sup>2</sup>, and Xavier Moonan<sup>3</sup>

<sup>1</sup>*Petroleum Geoscience Department: University of the West Indies, St. Augustine, Trinidad*

<sup>2</sup>*Petrotrin: Exploration & Geophysics Department, 1 South Street, Petrotrin Camp, Pointe-a-Pierre, Trinidad*

<sup>3</sup>*Centrica Energy: Eleven Albion, Corner Albion and Dere Streets, Port of Spain, Trinidad*

### Abstract

The southeasterly verging Early to Mid- Miocene La Fortune Anticline plunges into the Oropuche lagoon along the NW-SE trending Godineau tear fault. This anticline is well known as the prolific playground for Early Miocene ‘Retrench’ deep water sand-rich turbidite member of the marly Ciperó Formation. Though many wells have penetrated the Retrench Marl throughout the Southern Basin, the benthic foraminiferal ecostratigraphy of this radiolaria-rich member is currently unknown. A 4 m section exposed by excavation along the La Fortune Anticline was sampled in the summer of 2014. Twenty samples were recovered from it. They were washed over a 63 µm mesh to remove silt and clay, gently dried, and 250 – 300 benthonic foraminifera (*N*) picked from each sample. These were sorted into species. The planktonic foraminifera were examined to verify the age of the outcrop. The data acquired were compared with comparable data from the calcareous Princes Town Member (*Catapsydrax stainforthi* planktonic foraminiferal Zone, N6) and the Upper Ciperó Formation (*Globorotalia fohsi robusta* Zone, N12). The lowest sample contained the planktonic foraminifera *Praeobulina circularis*, indicating late *Praeobulina glomerosa* through *Globorotalia fohsi peripheroronda* Zone (= late N8 – N9) which is now placed within the early Middle Miocene. The benthic assemblage contained many *Planulina wuellerstorfi*, which is characterised as being a generalist species with a wide ecological niche. It is cosmopolitan in the deep sea, where it is adapted to environments with a relatively high food supply. This species was not previously recorded from the Zone N6, but is abundant in Zone N12. It appears that *P. wuellerstorfi* evolved between Zone N6 and late N8–N9. *Oridorsalis umbonatus*, the most abundant species recorded from Zone N6, is associated with sediment with a relatively low organic carbon content and deep pore-water oxygen penetration depths. This species, which has been characterised as being a specialist with a narrow palaeoecological niche, was only sporadically recovered from Zones N8–N9 and formed only 3.3% of the total recovery from Zone N12. It is concluded that there was an overall increase in the organic matter input to the Ciperó Formation between Zones N6 to N12.