

Permo-Carboniferous carbonates in the Venezuelan Andes: Petroleum potential and paleogeographic implications

Juan Carlos Laya Pereira

Durham University, Department of Earth Sciences

Durham, County Durham, UK

j.c.laya-pereira@durham.ac.uk

Upper Paleozoic strata in the northern part of South America were deposited extensively over stable cratonic areas and within more rapidly subsiding intracratonic basins. However, in many areas they are rarely exposed as a result of the rough terrain and dense vegetation, and thus they are poorly documented. However, they do have a significant petroleum potential, and indeed in Brazil they contain significant source and reservoir rocks. This project is focussed on a study of the Permo-Carboniferous carbonates of the Palmarito Formation, outcropping in the Venezuelan Andes, and is based on detailed field and lab work. The succession evolved from fluvial (Sabaneta Formation) through tidal-flat to mid-outer ramp deposits.

There is a long-term stratigraphic trend in $\delta^{13}\text{C}$ showing a progressive increase towards more positive values from -3.3 to +5.3. This probably relates to oceanographic changes and increased organic-carbon burial; support for this is provided by a parallel increase in TOC up through the succession with values reaching nearly 2%. There are also short-term variations in $\delta^{13}\text{C}$ which could perhaps relate to glacial-interglacial cycles and which could be related to variations in organic productivity.

The $\delta^{18}\text{O}$ data, based on whole-rock analyses, vary significantly between -11.0 to -2.1‰; there is a long-term trend towards less negative values through the succession. However, higher-frequency variations are again present, which could reflect local climate change or further evidence of the global Permo-Carboniferous glaciation. Thus, the isotopic and sedimentological data contribute further to our understanding of the potential upper Paleozoic petroleum system in Venezuela.