Late Oligocene - Late Miocene molluscs from Eastern Venezuela Basin : Evidence of upwellings from the Atlantic Ocean.

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The Oligo-Miocene molassic cycles have deposited plurikilometric thicknesses of terrigenous sediments in the foredeeps and the foreland of the Eastern Venezuelan Basin. These include marine, parallic, hypersaline, brackish, and freshwater sequences, which are difficult to tell apart only on lithological basis. Occasional molluscan horizons have helped to establish the paleo-environments and to date reliably the lithological units, where the microfauna have failed.

During the Late Oligocene, the Early Miocene and again the Late Miocene times, temperate marine genuses are present in the otherwise tropical paleo-climated shelf-sequences: Microdrillia, Sconsia, Agladrillia, Epitonium, Neverita, Acila, Calorhadia, Bathyarca, Mytilus (Mytilus), Chlamys, Trchycardium (Dallocardia), Nemocardium, Dinocardium, Tellina (Angulus), Psammobia, and Gouldia. The presence of authigenic glauconite in these horizons, suggest an upwelling phenomena. These upwellings are proposed to be related to the Intermediate Antarctic current, but in a shallower position, following the East Coast of South America and entering the Caribbean paleo-province through Venezuela. The brackish and freshwater assemblages remained tropical, well related to the South American autochthonous fauna.