AN INTEGRATED SEQUENCE STRATIGRAPHIC AND ISOTOPIC ANALYSIS OF THE CARBONIFEROUS STRATA OF BECHAR BASIN, WESTERN ALGERIA

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ABSTRACT

The Carboniferous represents one of the most important periods in Earth's history because of significant geologic events such as the formation of the supercontinent of Pangea and the onset of the late Paleozoic ice age (LPIA), the last major icehouse period since the appearance of land plants. The Carboniferous rise of tropical forest swamps affected atmospheric CO2 levels and hence global climate. Until recently, the LPIA was thought to be a single protracted glacial event up to 90 million years long, but recent studies across Gondwana challenge this concept and showed that it consisted of a series of discrete glacial intervals separated by non-glacial periods. Though our understanding is improving, several aspects of the LPIA and associated events still remain controversial. Since carbonate deposits are sensitive to fluctuations in climate, oceanography, and sea level they provide an ideal means of investigating the effect of glacial activity on these parameters. In addition, the carbon isotope stratigraphy of marine carbonate successions record climatic changes that result from fluctuations in the global carbon cycle. These fluctuations can be traced globally and are used to understand changes in the global climate and atmospheric pCO2.

The deposits of Becher Basin in Algeria, represent the most complete record of Carboniferous marine deposition on the North African platform, yet they remain poorly studied. Previously published δ13C curves for this interval are from deposits in Europe and North America. Although systematic, globally significant excursions are present in all, absolute δ13C values vary from place to place. These differences have been interpreted to reflect changes in global circulation patterns resulting from changes in plate tectonic configuration. Thus results from this work will fill the gap of understanding the paleoclimatological ocean circulation, which is currently missing in climate models. This research will also foster our understanding of carbon response and other response in the future climate change.

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