

Jamaican Oil Biomarkers Require a Re-examination of the Petroleum Geology of the Northern Caribbean

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Oils from the Windsor-1 well, drilled in 1982 by PCJ in the onshore north coast region of Jamaica, are derived from a mature, very oil-prone type II to type IIS kerogen, capable of prolific oil generation. A carbonate or marl source of Jurassic age is indicated. The biomarkers and carbon isotopes exactly match those of the Belmopan Field (Belize) oil (positive carbon isotope compositions and distinctive extended hopanes); both are very similar to Oxfordian aged Smackover derived oils of the central Gulf Coast region of the USA. The Smackover source succession comprises carbonate muds that accumulated in regional shallow seas following the marine transgression that ended the deposition of the Louann Salt. Existing models for Jamaica preclude Smackover settings for the Windsor-1 oils because they predict that an ocean floor regime existed in Jurassic times. In terms of the Pindell and Burke models for the Caribbean, Smackover source horizons could have been subsequently incorporated into Jamaica from Chortis and /or Yucatan as the island arc that dominates the island's geology was assembled in the late Cretaceous. Alternatively, an in-situ continental block could underlie, beneath a southwards directed thrust associated with the transcurrent Cayman Trough, the known geology of Jamaica. This latter possibility is compatible with the recent proposal by James (2003, AAPG Barcelona) that the Caribbean has an in-situ, that is a non-Pacific, origin. Regardless of the final model, the Windsor-1 results necessitate a re-examination of the petroleum geology of the northern Caribbean.
