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## **Are the Barinas-Apure crude oils all Cretaceous sourced?**

It is generally assumed that the Upper Cretaceous-Tertiary source rocks are mostly responsible for the hydrocarbon accumulations in northern South America. What is less appreciated is the contribution of potential Silurian-Devonian-Jurassic source rocks to the overall hydrocarbon reserves.

The purpose of this paper is to evaluate evidence concerning the so-called Venezuelan mixed crude oils and some variations within the classic marine crude oil families. Although work has been done to understand source rocks, oil families and hydrocarbon migration in Venezuela, new data on Barinas-Apure Basin crude oils clearly document an additional oil type (paraffinic-naphthenic vs typical aromatic-naphthenic). We suggest the possibility of these crude oils being sourced from older rocks (Pre-Cretaceous beds). A definitive oil-source rock correlation has to be found.

To test this hypothesis, we have adopted a rigorous approach to the petroleum system analysis by taking into account additional parameters in the analytical examination, including the incorporation of age-specific biomarkers and compositional data. Besides, an integrated basin modelling study of the interpreted Pre-Cretaceous interval is being carried out and shown here in order to get a better understanding of this proposed petroleum system.