

Diagenesis and hydrocarbon potential in paleozoic successions of the Lac Matapédia area, Québec

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ABSTRACT

Several oil and gas shows have been discovered in the Silurian-Devonian successions of Lac Matapédia area (Québec). Until recently, the hydrocarbon potential of these units was almost unknown. Source rocks, thermal maturation, biomarkers or reservoir studies were not available before our work.

Black slates of the Ruisseau Isabelle Mélange (Ordovician) and shaly limestones of the Forillon Formation (Devonian) are the most likely source rocks for these hydrocarbons. Total organic carbon reach values up to 2,7 and 1,7%, respectively.

Most of the Ordovician to Devonian successions in this area are overmature. However, some of the Silurian-Devonian units are locally in the potential oil window.

Recovered oils are nearly devoid of biomarkers belonging to the sterane group. However, oil extracts from the Ruisseau Isabelle Mélange have a sterane compositional pattern similar to oil extracts from the Macasty Formation (Upper Ordovician of Anticosti Island). The sterane composition of demonstrated Ordovician oil from western Newfoundland and that of the recovered oil from north-eastern Gaspé Peninsula show similarities. However, the latter two do not match biomarker patterns from the Macasty Formation and Ruisseau Isabelle Mélange.

Studied source rocks are rich enough in OM and adequately mature to have generated oils although the maturation was too high to preserve a significant amount of biomarkers for oil-source rocks correlations. The origin of Lac Matapédia oil is still open.