

## **A Modified Method of Microbial Analysis for Oil Exploration and its Application on Five Basins of Southern and Western Argentina**

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This communication presents the results of a modified version of the MPOG method for bacterial detection, applied to surface geochemical exploration for oil deposits. The modified MPOG method was applied in five sedimentary basins of the Argentina Republic that showed signs of hydrocarbon generation and/or proved oil production.

Sampling was carried out through transects of 20 to 40 km long and a separation between sample units of 300 to 400 metres. More than 2000 samples were analyzed. Soil samples were taken at 50 cm depth and determined their geological formation of origin also with granulometric and mineralogic characteristics. X-ray fluorescence for trace elements detection was also used. Modified MPOG method was considered to quantify the microbial flora capable to use butane for survival. It is based on the elimination of other carbon sources from the sample and the subsequent development in a minimum culture medium that only contributes with elements to provide viability, in a mainly butane atmosphere. The quantifying evaluation is done by filtration after extraction in sterile distilled water. These conditions permit the selection of the interest flora minimizing interference from the associated microbial community.

The results for the different sedimentary basins showed many common characteristics like:

a) Lognormal multimodal distribution, b) Differences of 1000 % between anomalous and background values, c) three well defined populations in the vast majority of cases: background data (with or without source rock signal), oil deposit derived anomalies, and fault derived anomalies (the most permeable way of escape for microseepage gases).

The sensitivity of this modified MPOG method, its values range, the reasonable variance present in repetitions over the same sample, guarantees the reliance indifferent types of applications in exploration and production, from wildcat exploration to temporal variation of production wells through microseepage analysis.