

**Biomarkers as tools to determine the origin of hydrocarbon emanations: Oil outcrop of La Libertad, Ecuador, August 2016**

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The region of the Santa Elena Peninsula in Ecuador has been known since colonial times because of the presence of natural oil outcrops. At the end of August 2016, an oily emanation appeared on the beach of the breakwater in the city of La Libertad (Santa Elena, Ecuador), which due to its characteristics and proximity to a fuel station and a refinery, a natural or anthropic origin could not be established with certainty. The commercial activities of the area surrounding the emanation were suspended on account of a strong odors. The preliminary description, as well as the physicochemical characteristics of the emanation did not allow to explain the origin. The imperative necessity to establish the source of these hydrocarbons, has led the application of the study of biomarkers as a reliable and accurate geochemical tool in the identification of the origin of the upwelling. The particular distribution of isoprenoids exhibited, as well as the pristane / phytane relations, are clear indicators of genetic correlation between the studied upwelling and the crude oil of the nearby Ancón field. On the other hand, the presence of the tri-, tetra- and pentacyclic terpanes, as well as steranes, are incoherent with an anthropic origin for the samples, because these compounds would not be found in the light fractions of a refined product of anthropogenic origin. The results presented above allow discard an anthropic origin for the hydrocarbon emanation. The studied emanation of La Libertad appears aligned with other manifestations reported on the coast of Puerto Lucía, La Milina, Santa Rosa and San Lorenzo, suggesting a lateral connectivity among the oils produced in the nearby fields and reservoirs unknown today yet.