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Preliminary geochemical results of corals from the Puerto Morelos Reef, Southeastern Mexico

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A microprobe (MB), major, trace and rare earth elements (REE) analyses were carried out in three coral species *Acropora palmata*, *Acropora cervicornis* and *Gorgonia ventalina* at Puerto Morelos, Reef, Southeastern Mexico. This was done to assess the degree in which the corals developed under the different chemical-physical natural and artificial conditions. The corals were cut at the top and middle and based upon the observations by using the MB analysis, results showed the highest concentrations of Ag, Cu, Cr, Ni, S, Sr, Zn y Zr in *Gorgonia Ventalina* suggesting an impact coming from the industrial discharges and/or rusting of boats in the area. The results of X-ray fluorescence analysis for major and trace elements showed that the Fe , Sr and Zr increase their content in the skeletons of *Acropora palmata* y *Gorgonia ventalina* also asociated with the presence of human activity since the area is composed mainly by carbonate source sediments.

The rare earth elements (REE) analysis showed that the negative anomaly of Ce suggests a well oxygenated, highly oxidative modern shallow waters, and high nutrients related to suspended matter for *Acropora Palmata, Acropora cervicornis* y *Gorgonia ventalina*, The Positive Eu anomaly in the corals are due to the development of the reef linked to the concentration of waters enriched in La. The Nd/Yb ratio indicates a shallow water development for the corals. This is also supported by the Ce/Ce* vs. Pr/Pr* ratios that indicate shallow marine waters in the development of the three corals studied (Ce*= 0.5La+0.5Pr and Pr*= 0.5Ce+0.5Nd). Enrichment of heavy rare earth elements (Gd-Lu) in the corals may be associated with high pH values and CO, OH- ions in the sea water.