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Evidences of the Presence of Methane Seeps in the Colombian Caribbean Sea

Adriana Gracia (1), Nelson Rangel-Buitrago (2), Javier Sellanes (3,4)

(1) Instituto de Investigaciones Marinas y Costeras –INVEMAR. Cerro de Punta Betín, Sociedad Portuaria. Programa de Biodiversidad y Ecosistemas Marinos. Colombia. Email: agracia@invemar.org.co, (2) Departamento de Geología, Facultad de Ciencias del Mar y Ambientales. Universidad de Cádiz. Campus de Río San Pedro, s/n. 11510 Puerto Real, España. nelson.rangelbuitrago@mail.uca.es, (3) Departamento de Biología Marina, Facultad de Ciencias del Mar, Universidad Católica del Norte, Larrondo 1281, Coquimbo, Chile., (4) Centro de Investigación Oceanográfica en el Pacífico Sur-Oriental (COPAS), Universidad de Concepción, Chile.

For the first time in the southern Caribbean Sea Margin of Colombia (between 450 – 700 m deep) we confirm the presence of methane seep communities near the deltas of the Magdalena and Sinu rivers. Some evidences of the occurrence of those communities include: i) bivalves constituents of marine chemosynthesis-based communities, which are indicators of reducing environments as vesicomyid and lucinid bivalves (Vesicomya caribbea, Calyptogena ponderosa, Ectenagena modioliforma, Lucinoma spp. and Graecina colombiensis), together with the rare solemyid clam Acharax caribbaea, ii) other seep-associated fauna such as the trochid snail Cataegis meroglypta, iii) the first report of vestimentiferan tubeworms for the area and, iv) the presence of authigenic carbonates; these constructions form hard substrates colonized by sessile fauna. Additionally, more than 20 species of benthic non-seep fauna were found associated in the area. The collected fauna exhibits an elevated taxonomic similarity to other modern and fossil seep communities from the Caribbean (Barbados Prism, Gulf of Mexico, Cenozoic seep taxa from Barbados, Trinidad and Venezuela). The presence of these chemosymbiotic species seems to be related to mud diapirism activity in the South West of the Colombian coast, this geologic characteristic indicates tectonic and depositional processes associated with the aforementioned deltas. Further research is necessary to establish biological and geological interactions, geochemical and geophysical controls, and organization of cold seeps communities in this unexplored area of the Caribbean.

Keywords: Methane, Chemosynthesis-based communities,Bivalves, Mud diapirs, Colombian Caribbean Sea