

Petroleum Geology of the Vaupés-Amazonas Basin of Colombia

Mario Garcia-Gonzalez, Ricardo Mier-Umaña, and Luis E. Cruz-Guevara
Geology, Universidad Industrial de Santander, Bucaramanga, Colombia.

The Vaupés - Amazonas basin of Colombia is the second largest onshore basin after the Llanos basin. This intracratonic basin covers an area of 155.000 km². It is located to the south of Colombia, with the following boundaries: to the north, with the Guaviare River and the Arco de Vaupés; to the east, with the Migmatite Complex of Mitu and the Trampa - Caruru Peak; to the south, with the Putumayo and Amazonas River; to the southeast, with the Solimões Basin in Brazil; and to the west, with the Chiribiquete Mountain Range.

The stratigraphic correlation between the Vaupés-Amazonas Basins in Colombia (to the NW) and the Solimoes basin in Brazil (SE of Brazil) allows observing that the sedimentary sequences become thinner the east. In Colombia, the Paleozoic sequence presents uneven sections due to erosion or to the lack of sedimentation, whereas the Solimoes basin presents a complete sequence, that get thicker in the lower Amazons basin of Brazil, where most of the Paleozoic section is present.

The structural style of the Vaupés-Amazonas basin is characterized by the presence of plateaus and slopes affected by a basement fault system with vertical fault-planes. Faults and strike patterns are presented in two predominant directions: The first one is NNE-SSW, probably Proterozoic, which limits uplifted blocks and intra-continent rift valleys such as La Trampa. The second direction is NW-SE, probably formed during the Early Proterozoic, and reactivated in the Cenozoic.

In the Vaupés-Amazonas basin, three oil systems are proposed: 1) the Upper Paleozoic oil-bearing system, 2) the Tertiary oil-bearing system and 3) the Cacheta-Carbonera oil-bearing system. The first two oil-bearing systems have not been proven; therefore, a drilling program is required to verify existence; whereas the third oil-bearing system mentioned has been proven in the northern boundary of the basin where several oil wells have found heavy oil in the Carbonera Formation sandstones.