Geophysical Research Abstracts
Vol. 14, EGU2012-10507, 2012
EGU General Assembly 2012

Facies, Stratigraphic and Depositional Model of the Sediments in the Abrolhos Archipelago (Bahia, BRAZIL)

R.R. Matte and E.E. Zambonato
Petrobras - Petroleo Brasileiro S.A.

Located in the Mucuri Basin on the continental shelf of southern Bahia state, northeast Brazil, about 70 km from the city of Caravelas,the Abrolhos archipelago is made up of five islands; Santa Barbara, Redonda, Siriba, Guarita and Sueste.
The exhumed sediments in the Abrolhos archipelago are a rare record of the turbidite systems which fill the Brazilian Atlantic Basin, and are probably an unprecedented example of a plataform turbidite system (Dr. Mutti, personal communication). Despite the limited area, the outcrops display a wide facies variation produced by different depositional processes, and also allow for the observation of the layer geometries.
Associated with such sedimentary rocks, the Abrolhos Volcanic Complex belongs stratigraphically to the Abrolhos Formation. These igneous rocks were dated by the Ar / Ar method, with ages ranging from 60 to 40 My, placing such Volcanic Complex between the Paleocene and Eocene. The sedimentary section is best exposed in the Santa Barbara and Redonda islands and altogether it is 70 m thick. The measured vertical sections show a good stratigraphic correlation between the rocks of the western portion of the first island and those of Redonda Island. However, there is no correlation between the eastern and western portions of Santa Barbara Island, since they are very likely interrupted by the igneous intrusion and possibly by faulting.
The sedimentary stack consists of deposits with alternated regressive and transgressive episodes interpreted as high frequency sequences. The coarse facies, sandstones and conglomerates, with abrupt or erosive bases record regressive phases. On the other hand, finer sandstones and siltstones facies, which are partly bioturbated, correspond to phases of a little sediment supply. In the central and eastern portions of Santa Barbara Island, there is a trend of progradational stacking, while both in the western portion of Santa Barbara and in Redonda islands an agradational trend is observed. The predominance of layers with tabular geometry, characteristic of turbidite lobes, the presence of hummocky stratification, trace fossils typical of shallow water (Ophiomorphs and Thalassinoides), all associated with the occurrence of the carbonaceous material as well as plant fragments suggest a deltaic/ plataform depositional context. Textural features and sedimentary structures observed in the conglomerates and sandstones show the action of gravitational flows of high and low density. The fine interlaminated sandstones and siltstones later deformed as slumps or slides, and conglomerates with oriented clasts indicate, respectively, mass movements and action of debris flow. Conglomeratic lags levels record a bypass phenomenon.
There are no biostratigraphic data in these studied outcrops. However, petrographic analyses revealed the presence of fragments of igneous rocks (basalts and diabases) in both sandstones and conglomerates, suggesting a relative contemporaneity between igneous activity and sediment deposition. Futhermore, petrographic analyses also found poor permo-porous conditions in the reservoirs due to the presence of fragments of volcanic rocks and the abundance of intraclasts / pseudomatrix.