

The Petroleum Prospectivity of the Apulian Carbonate Platform Margin and Key Tectonic and Stratigraphic Controls

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ABSTRACT

The Apulian platform is the most prolific Mesozoic carbonate platform domain within the Central Mediterranean as highlighted by the giant oil fields of the Val d'Agri Complex in Southern Italy. The margin of the Apulian Platform is buried westwards beneath the Apennine thrust sheets, whereas to the east the adjacent domain includes basinal sequences of the Ionian Basin and their lateral equivalent units offshore Italy. In the southern portions of the Adriatic foreland there are still conflicting and often erroneous interpretations in the literature on the location of the platform margin. The main petroleum plays in proximity of the Apulian platform margin are oil bearing Cretaceous karstic carbonates as evidenced by the Rospo Mare heavy oil producing field (94MM bbl EUR), and oil discoveries in Oligocene carbonate build-ups which are yet to be appraised (eg. Giove-2 & Medusa-1 offshore Italy, A4-1X offshore Albania). A major exploration development could be represented by prolific deeper objectives within Cretaceous karstic carbonates in the latter oil discoveries. In the Medusa-1 well significant oil shows were encountered in the Cretaceous carbonates, due to drilling difficulties the Cretaceous target could not be tested. The distribution of such oil shows suggests an OWC significantly deeper than the deepest closing contour at top Cretaceous structural level, likely due to the presence of intra-formational seals. The margin of Apulian platform is characterised by a well developed rugosity being strongly controlled by a complex fault network, this is well documented onshore (Gargano Promontory, Maiella Mountain) where the margin outcrops. Mesozoic extension and foreland subsidence ahead of the westward migrating Dinarides thrust belt during the Late Tertiary are the key controls for hydrocarbon generation. Significant hydrocarbon generation occurred in the Late Tertiary and short distance migration pathways are likely resulting from mature Triassic source rocks in proximity of the Apulian platform margin in several areas. This study integrates all available subsurface and outcrop data from southern Italy, southern Albania and Greece to better define the correct location of the Apulian platform margin in the southernmost part of the Adriatic sea which is still largely underexplored. The results of this study and review of past works highlight the significant HC potential of the Apulian platform margin and the adjacent base of slope carbonate sequences.