

Evolution and Hydrocarbon Prospectivity of Gondwanic Satpura Basin, Central India

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Satpura Basin, the westernmost Gondwana basin of Peninsular India, is spread over an area of 12000 sq.kms. A thick sedimentary column, around 6500m in the northern part, in proximity to an established hydrocarbon province promotes Satpura Basin as the most prospective candidate for expanding the horizons of Gondwana hydrocarbons in India beyond the established Krishna-Godavari province.

This communication integrates available geoscientific data to analyze the evolution of Satpura Basin and its implications in hydrocarbon prospectivity of the basin. Relative dominance of either of the two dominant tectonic influences on the basin, Son-Narmada Lineament and Pranhita-Godavari Fault, and their respective senses of slip appear to control the basin's tectono-sedimentary evolution. Migration of the predominant depocentre is deciphered and concurs very well with regional tectonic observations. A northward sloping basin floor, swinging from a western tilt till Late Permian (Motur) deposition to an eastern tilt since then is interpreted. Strike slip movements along the two dominant tectonic trends resulted in localized transpression, starting during late Motur and terminating with the Late to Latest Permian deposition (Bijori), that gave rise to antiforms. This communication further explores the hydrocarbon potential of the basin as a whole by identifying two possible petroleum systems, Barakar-Barakar(?) and Bijori-Pachmarhi(?), worth pursuing. With an expansive geographical and stratigraphic extent, the former offers a better bet for striking hydrocarbons in the basin compared to the restricted later. All relevant facets suggest the north-western part of the basin to be the most prospective for exploring the Barakar-Barakar(?) Petroleum System.