

Integrated Surface Geochemical Studies for Hydrocarbon Prospects in Deccan Syneclise, India

- Hydrocarbon prospect evaluation of western and central regions of Deccan Syneclise, using surface geochemical methods.
- Anomalous concentrations of C_1 - C_3 and propane oxidizing bacteria are reported in the near surface soils.
- Carbon isotopic signatures indicate that gases have undergone secondary alteration subsequent to migration or that they are derived from gas producing type III kerogen. $\delta^{13}C$ signatures of soil carbonates infer hydrocarbon induced alterations in the surface soils.
- Geochemical data was integrated with the geophysical model for the area representing the Deccan trap layer and underlying sub-trappean Gondwana sediments. The variation in the distribution of methane concentration observed along the traverse indicates high concentrations of methane and low concentrations of C_{2+} in the southern half of the traverse, where the trap thickness ranges between 0.8 and 1.2 km while the thickness of underlying sediments varies from 0.5 to 1 km (Fig. 1). In the middle of the traverse it is observed that although there is slight decrease in the concentrations of methane, the presence of C_{2+} hydrocarbons is considered to be prominent. This region has comparatively thick sediments of up to ~2 km indicating significant sedimentation with favourable conditions for generation of methane and its higher homologues. However, a thick trap of ~2 km overlying the sediments may hinder the micro seepage of hydrocarbons in this region resulting in decrease in the overall concentration of hydrocarbons. Geochemical anomalies corroborate thick sub-trappean sediments demarcated by geophysical studies.

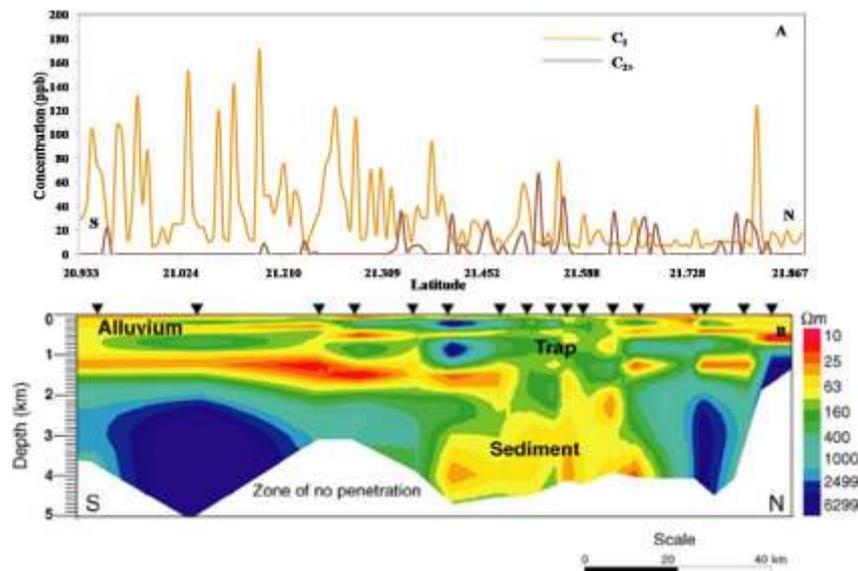


Fig. 1 Variation of methane (C_1) and ethane plus propane (C_{2+}) concentration in soil samples between Khandwa and Edlabad (A) against the model depicting the thickness of deccan trap and sediments from MT studies after Patro et al., 2005 (B).

For further details: Kalpana, M.S., Madhavi, T., Devleena Mani, Lakshmi, M. Pundaree, N., Sujai, M., Kavitha, S., Amar Prakash Devekar, Patil, D.J., Dayal, A.M. and Haragopal V.(2016). Journal of Petroleum Science and Engineering <http://www.sciencedirect.com/science/article/pii/S0920410516304107>