

HYDROCARBON GENERATION POTENTIAL OF THE MANNAR BASIN, SRI LANKA

**Amila Sandaruwan Ratnayake^{1*}, Chaminda Wimal Kularathne²
and Yoshikazu Sampei¹**

¹*Department of Geoscience, Faculty of Science and Engineering, Shimane University,
Nishikawatsu-cho 1060, Matsue 690-8504, Japan.*

²*Petroleum Resources Development Secretariat (PRDS), Level 06, Ceylinco House,
69, Janadhipathi Mawatha, Colombo 01.
amilageopera@gmail.com*

The Mannar Basin comprising Upper Jurassic to Recent sedimentary successions is located between southeast India and northwest Sri Lanka. This study attempts to determine its hydrocarbon generation potential, where, Late Cretaceous and Paleogene sediments were analysed to evaluate kerogen type, thermal maturity of organic matter based on Rock-Eval pyrolysis and vitrinite reflectance. The Hydrogen Index (HI) values varying from 77 to 785 mg HC/g TOC suggested that the sediments are a mix of Type II-III and Type III kerogen. Maturity in terms of Tmax varied from 332°C to 456°C and vitrinite reflectance values ranged from 0.26 to 1.49%. The maturity indicators revealed a mix of both immature and mature sediments, where the Tmax of Late Cretaceous sediments (Tmax 332°C to 456°C, average = 423°C ± 25) was about 4°C higher than the Paleogene sediments (Tmax, 388°C to 431°C, average 419°C ± 10). In addition, Type II-III (oil and gas prone) and Type III (gas prone) kerogen-rich Late Cretaceous sediments of the Dorado and Barracuda wells show maturity levels for a probable oil window. Therefore, the analysed samples collected from present drilled depths indicated incomplete thermal conversion required for the generation of wet gas.

Keywords: Rock-Eval pyrolysis, Vitrinite reflectance, Kerogen type, Petroleum geochemistry