Neogene Biosiliceous Microfossils and their in Deep Sea Water Oil Exploration and Expansion of Petroleum Prospects from Cavernous Sediments in the Mahanadi Basin, East Coast of India

Anand Gupta, M. Shanmukhappa, and M. D. Sutariya
Palynology Division, Geology Group, KDMIPE, ONGC, Dehradun, India
anandpaly@gmail.com

The biosiliceous microfossils viz. Diatoms and Radiolarians are emerging contemporary potential tools for dating of sediments, deciphering depositional environment, biochronological correlations, inferring paleotemperature and recognition of paleo-oceanographic events in deep sea water sediments, where other conservative microfossil groups are deficient. The studies of these rare siliceous fossil groups are enabling to provide the valuable information, where the seismic signatures or other related deep sea water structures are not properly identified or recognised by the conventional methods.

A well-preserved and diverse assemblage of biosiliceous microfossils (diatom and radiolarians) is recorded first time from the Neogene subterranean sediments, in the Mahanadi Basin, East Coast of India. An attempt has been made to provide laboratory backup for age determination, deciphering of depositional environments, paleoclimatic conditions, biochronological correlations and paleo-oceanographic events to explore expansions of petroleum prospects in deeper sediments of the basin.

The studies of Middle to Upper Miocene (13.82 Ma to 07.25Ma) sediments at well-C and Upper Miocene to Lower Pliocene? (07.25 Ma to 5.33 Ma) sediments of wells - A and B (Hydrocarbon producers) proposed three diatoms and four radiolarians biozonation schemes and tied directly to paleomagnetic reversal records.

The recovered Middle to Late Miocene biosiliceous microfossils suggest deeper water condition of deposition (>400-1000 m) under warm to temperate climate; whereas Upper Miocene to Lower Pliocene? sediments are observed to be deposited in shallow water (0-400m) under warm water realm.

The studied section of these wells, which comprises two distinct age, paleoenvironmental regimes, paleobathymetric realms and paleo-oceanographic events, may be useful in biochronological correlations, refinement of paleo-oceanographic and paleogeographic analysis of deep water sedimentary processes to delineate the extension of petroleum prospects in the study area and in close proximity of the basin.