

ABSTRACT

The ENE-WSW trending Lower Narmada Valley (LNV) comprises an almost complete sequence of the Cretaceous Period and preserves imprints of the major Cretaceous global events like sea-level rise, Deccan volcanism and mass extinctions. The LNV is divided into Eastern Lower Narmada Valley (ELNV) and the Western Lower Narmada Valley (WLNV) and the latter is investigated geologically in the present study. The purpose of the research was to propose a lithostratigraphy and to analyze the sedimentological, ichnological and sequence stratigraphy aspects to interpret the paleoecology and depositional environment and correlate with the pervasive Tethyan basins.

To achieve the above goals, systematic studies were carried out in the exposed sequence of the Bagh Group at thirty-two localities; lithologs were constructed for the LNV. The earlier lithostratigraphy consist informal units, ambiguous boundaries and lacks the stratotypes. Moreover, there exists multiplicity in the nomenclature of the units with several homonyms and synonym and number of informal units, which has created chaos in the literature. Based on field observations, laboratory studies, vertical and lateral lithological variations; lithostratigraphy is revised for WLNV as per the International Subcommission on Stratigraphic Classification, emphasizing the retention of the original units and new units are proposed wherever necessary. The study describes the units with their historical background, intent and utility, designation, stratotype, boundaries, age, depositional environment and are compared with the ELNV units.

The new data is generated on sedimentology and ichnology of the Cretaceous WLNV sequence. The sedimentological characteristics revealed fourteen lithofacies which were interpreted for the depositional environment. Total 26 ichnospecies belonging to 17 ichnogenera were identified and analyzed for ethological categorization, ichnoassemblages and ichnofacies, which led to interpretation of paleoecological and paleoenvironmental conditions of the WLNV basin. The lithostratigraphic, sedimentological, and ichnological data are integrated for the identification and analysis of systems tracts, sequence boundary, sequence stratigraphic surface, and minor within-trend surfaces. Sea-level curve is drawn based on shoreline trajectory and compared with the eustatic curve and finally, reconstructed a sequence stratigraphic model for the Cretaceous Bagh Group sequence of the WLNV. The data of the WLNV is further correlated with pervasive Cretaceous Tethyan basins like ELNV, Eastern Desert, Saurashtra, Camarvon, Mahajanga, Cauvery and Kachchh to understand the rift events and eustatic sea-level changes.