

SEQUENCE STRATIGRAPHIC AND PALYNOSTRATIGRAPHIC FRAMEWORK OF THE TOARCIAN- BATHONIAN STRATIGRAPHIC UNIT IN CHICHALI NALA, SURGHAR RANGE PUNJAB, PAKISTAN

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Abstract

The Toarcian-Bathonian Shinawari Formation exposed in the Chichali Nala, Trans Indus ranges has been studied for sedimentology, palynostratigraphy, and sequence stratigraphic frame work. This is mainly comprised of limestone, sandstone, carbonaceous shale, coal, marls, mudstone and presence of hardgrounds. Limestone has variable texture such as gray to dark gray color on fresh surface and dark brown to brown yellowish on weathered surface, medium to coarse grained and abundantly fossiliferous, while marl is gray to dark gray in color. The clastic units such as sandstone are maroon in color while shale is gray to dark gray and carbonaceous in color. The palynostratigraphy is established on the base of plants microfossils such as pollen, spores and acritarchs and correspond to two different assemblage biozones, i.e. 1) *Callialasporites turbatus* assemblages biozones (CTUABZ I) and 2) *Callialasporites trilobatus* assemblages biozones (CTLABZ II) representing Toarcian-Bajocian and Bajocian-middle Bathonian respectively. The sedimentological interpretation of the studied unit is based on the microfacies and palynofacies analysis. The microfacies with palynofacies analysis portrayed a wide range of environments ranging from continental to outer ramp platform settings. Furthermore, the sequence stratigraphic interpretations are based on integration of outcrop data, palynostratigraphy and sedimentology data. Almost 125 m thick carbonate and clastic stratigraphic unit of Shinawari Formation represented two 2nd orders and four 3rd orders local sequences i.e. TST and HST, while in same global time it represented three 2nd orders and twenty one 3rd orders global sequences i.e. TST, HST, SMW and LSW. The dividing agent of system tract are sequence boundary and maximum flooding surface. The sequence boundary is marked from the laterite beds, while maximum flooding surface are marked from the chert beds. The system tracts is further sub divided into 4th/5th order cycles, which are recognized from changes of retrogradational facies pattern to progradational pattern. The comparison of local sequences with the global sea level charts indicates that the tectonic and climate was the main controlling factor for the variation at 3rd and 4th order of cycles.