

Anatomy of a Latest Chattian Carbonate Ramp with Larger Foraminifera and Coralline Algae (Prebetic Domain; SE Spain)

Telm Bover-Arnal¹, Carles Ferràndez-Cañadell¹, Julio Aguirre², Eduard Albert-Villanueva³, Mateu Esteban⁴, José Fernández Carmona⁵, and Ramon Salas⁶

¹Universitat de Barcelona

²Universidad de Granada

³Universitat de Barcelona

⁴Repsol Exploración S.A.

⁵Szalai Grup S.L.

⁶Universitat de Barcelona

Abstract

Oligo-Miocene carbonate ramps dominated by larger foraminifera and red algae constitute important hydrocarbon reservoirs worldwide (i.e., Asmari Formation in SW Iran or the Perla Field in the Gulf of Venezuela). Thus, the study of these characteristic facies in outcrop analogues allows achieving a better reservoir understanding. In the Prebetic Domain (SE Iberian Peninsula), an Oligocene kilometre-scale continuous rock exposure containing coralline algae and abundant and diverse larger foraminifera gives rise to the Benitatxell Range. The lithostratigraphic unit analyzed exhibits a rather constant thickness with a lateral facies evolution that deepens from the northeast to the southwest. Accordingly, the depositional profile is interpreted as a carbonate ramp. The carbonates studied correspond to rudstone textures dominated by small ovate and large flat lepidocyclinids. Other common rotaliids are *Amphistegina*, *Heterostegina*, *Operculina*, *Spiroclypeus*, *Nummulites*, *Risananeiza*, *Miogypsinoidea* and *Rotalia*. This limestone unit was dated as latest Chattian on account of the recognition of the larger foraminifera assemblage, characteristic of the Shallow Benthic Zone 23. Coralline algae identified are *Sporolithon*, *Lithothamnion*, *Mesophyllum*, *Spongites*, *Neogoniolithon* and laminar thalli attributed to either *Lithoporella* or *Mastophora*. Fragments of geniculate corallines occur. Ellipsoidal to sphaeroidal rhodoliths made up of thin encrusting coralline algal coating and thick covers of laminar, encrusting and warty algal growth forms are frequent. Nuclei are mainly bryozoans, larger foraminifera, balanids, fragments of corals and sediment. Coralline algae intergrow with bryozoans, encrusting foraminifers and serpulids. Other present to frequent skeletal components are wholly preserved scleractinian corals, smaller benthic foraminifera, *Ditrupea* and fragments of echinoids and other molluscs. Taphonomic signatures on skeletal components such as abrasion, fragmentation, encrustation and bioerosion are indicative of slow sedimentation rates and reworking. The lepidocyclinid limestones are found between siliciclastic-influenced lithostratigraphic units rich in planktic foraminifera and were thus deposited during a long-term normal regressive stage of relative sea level. The carbonates analyzed were formed under warm, tropical to subtropical regimes during the latest Chattian interglacial period.