

The Exhumed Tethyan Passive Margin of Eastern Sardinia – An Analogue for the Atlantic Margin Upper Jurassic Carbonate Play Fairways

The Upper Jurassic carbonates of eastern Sardinia provide sound analogue for coeval systems from the West Africa Atlantic margin. Similarly to the Atlantic systems, Eastern Sardinia carbonates were deposited perched onto a passive margin with a crystalline horst at the inboard basin termination. These basins share also a comparable type and evolution through time of the carbonate factory resulting in similar facies belt.

The long-term stratigraphic architecture of Upper Jurassic carbonates will be presented along a series of seismic-scale outcrops which allowed to observe a number of sea-level driven platform progradation and backstepping. In addition, seismic-scale outcrops will allow to appreciate:

- (i) the distribution of dolomitized bodies in different areas of the passive margin, from proximal to distal settings;
- (ii) the effect of Tertiary strike-slip tectonism and its control on present day local geomorphology.

A series of key outcrop will be used to illustrate and discuss the sedimentologic and stratigraphic expression of some key surfaces including:

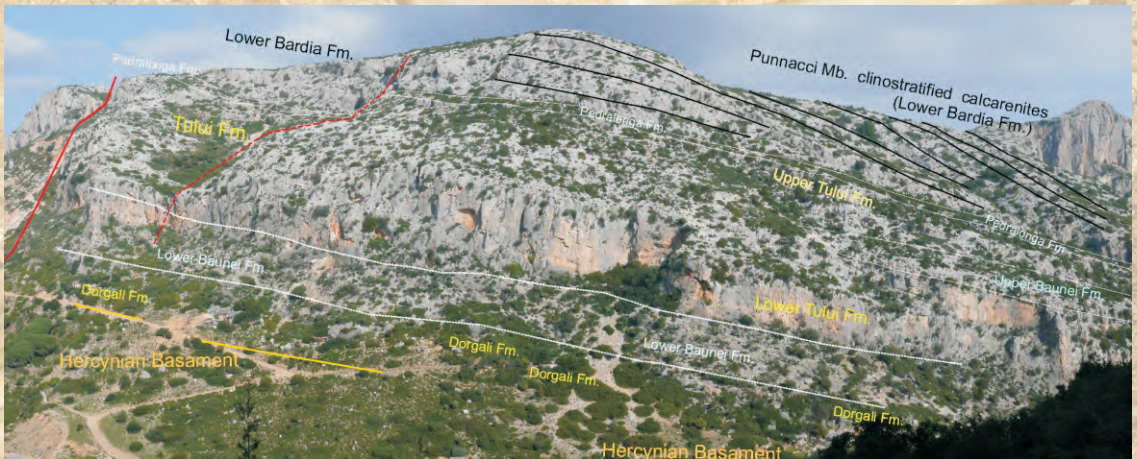
- sequence boundary (platform exposure and implication for karst development)
- downlap surface and progradation of shallow water carbonate deposystems

A special focus will be placed on high-energy platform margin facies, which usually represents a suite exploration target. Eastern Sardinia offers the opportunity to examine the facies association of:

- Oxfordian – Kimmeridgian oolitic shoals and intercalated coral-stromatoporoid knolls;
- Tithonian microbial-coral-stromatoporoid bioherms;
- Tithonian – Berriasian skeletal shoals, which will be presented along extensive saw-cut quarry faces.

This field trip will also present a series of syn-sedimentary tectonic features including basin-scale out-of-sequence unconformity and associated megabreccias, sedimentary dikes, and a polyphasic fracture network which developed in Tithonian skeletal shoal and microbial-dominated bioherms during the early diagenetic and shallow burial history.

Below - The Upper Jurassic-Berriasian succession of eastern Sardinia (After Jadoul et al., 2010).



Provisional program

Day 1 - The Carbonate Palaeohigh Succession

- The Geology of Sardinia (Hercynian Phase, the Mid Jurassic platform margin, Tertiary strike-slip events, the Tyrrhenian Phase)
- Limestone vs Dolomite (Mt. Korrasi & Mt. Albo)
- "Codula di Luna" carbonate high succession – local palaeogeography
- Where to put a carbonate sequence boundary - Facies architecture of palaeoexposures
- "Passive" Margin tectonism - Sedimentary dikes

Day 2 - Stratigraphy of the Southern Intraplatform Basin

- The "syn-rift" siliciclastic sequence of Genna Ramene
- Architecture and Chemostratigraphy of the Baunei Basin
- Tithonian carbonate progrades, stratigraphic controls on facies composition and prospectivity
- Drowned outer platform facies of the "Pedra Longa Section"
- Out-of-sequence "mid Tithonian" erosional surface and the associated megabreccias

Day 3 - Tithonian Platform Margin Succession

- Boat trip along Orosei Gulf
- Plio-quaternary epikarst of "La grotto del Fico" (The "Figue Cave")
- Quantitative paleoecology of Tithonian microbial-coral-stromatoporoids bioherms
- Stratigraphic architecture of Tithonian "open platform" skeletal shoal system of the Orosei Quarry
- Origin and evolution of syndepositional to shallow burial fractures in Tithonian platform margin strata.

Below - Tithonian shoal margin facies of the Orosei quarry (After Lanfranchi, 2008).

Who Should Attend

General geologists, petroleum geologists, geophysicists, sedimentologists, reservoir modelers, reservoir engineers, and petrophysicists.

Dates: to be defined. The field trip requires three (3) full days from dawn to dusk, ideally March to May or September to early October.

Leaders: Alessandro Lanfranchi is a geologist specialised in carbonate sedimentology, stratigraphy and diagenesis at Università degli Studi di Milano with a PhD dissertation on Sardinian carbonate deposystems. After a three year experience as post-doctoral researcher he moved to Oolithica in 2011. Currently he is involved in the study of Mesozoic carbonates from the African Central Atlantic province.

Fee: £1700 / participant (assuming 8 attendees). Flights are excluded.

Includes: Boat trip along Orosei Gulf, three night lodging based on double occupancy. Breakfast, packed lunch and evening restaurant meal.

Note:

April-March as well as September-October in Sardinia are generally warm and sunny, but short-lasting storm may occur. Be prepared for rain and cool conditions as well as very warm weather.

Hiking conditions are moderately to aggressive. Hiking boots and extra socks are strongly recommended.

Swimming suit is indicated to relax during breaks and in the evenings.

