



The drowning sequence of the paleogenic carbonate ramp outcropping in the Trieste Karst

G. Burelli (1), D. Masetti (1), S. Furlani (1), S. Biolchi (1), S. Bensi (1), F. Cucchi (1) and C. Piano (2)

(1) DiSGAM, University of Trieste, Italy, (2) Geological Service FVG, gburelli@units.it

A thick shallow-water carbonate succession outcrops in the Trieste Karst. It corresponds to the informal stratigraphical unit called “Calcari del Carso Triestino”, spanning in time from the Aptian p.p. to the Lower Eocene. The unit is further subdivided in six members: Monte Coste Mb. (Aptian p.p. - Albian p.p.), Rupingrande Mb. (Albian p.p. - Turonian inf. p.p.), Borgo Grotta Gigante Mb. (Turonian inf. p.p. - Senonian p.p.), Monte Grisa Mb. (Paleocene p.p.) and Opicina Mb. (Paleocene p.p. - Lower Eocene). The carbonate unit is overlaid by Lutetian sandstones and marls alternations belonging to the deep-water siliciclastic succession called “Flysch di Trieste”. From a structural point of view the Trieste Karst represents the southernmost limb of a NW-SE asymmetrical anticline. The paleogenic carbonate platform consists of a deepening-upward 42 meter thick succession connecting the platform top to the deep-water marls unit that lays just at the bottom of the Flysch. Bioclastic grainstones with traction structures, typical of sandy shoals and organized in metric beds, have been surveyed at the top of the Opicina Mb platform. The drowning sequence is composed by the following units:

- A 42 meter thick unit made by limestone-marls couplets, organized in thickening and coarsening upward 3-meter thick cycles. The coarsening upward trend of each cycle is recorded by the following vertical transition: from peloidal calcisiltite with planktonic foraminifera at the bottom of the cycle, to bioclastic calcirudites-calcarenites with traction structure at the top. Wavy bedding planes and well-developed nodular structures have been observed. This unit can be interpreted as deposited onto a deepening sea-floor lacking of any evidence of sediment gravity flows during a third order

transgressive systems tract. Each metric cycle can be interpreted as an high-frequency cycle recording progradation phase of the platform inside this transgressive tract.

- Few meters below the marly beds, two conglomeratic levels outcrop. They are characterized by monogenic rounded pebbles fed by the shallow water platform materials. Pebbles are embedded in a marly matrix and their size ranges between 3 cm to 10 cm. Their fabric is chaotic and not organized. They can be interpreted as reworked diagenetic nodules, previously cemented by gravity flows. Resedimentation was probably triggered by tectonic movements occurring at the same time of the first turbidites arrival in other portion of the basin. This study provides new data on the depositional environment of the carbonate platform succession corresponding to the Opicina Mb. In particular:

1. marls and limestones couplets represent a new unit never recognized before in the Opicina Mb;
2. the superposition of the limestone-marls couplets to the grainstone shoals at the margin of the platform records a third-order transgressive systems tract. That allows to interpret the depositional model of the carbonate platform as a ramp, connected to the sea-floor by a gentle slopes on which high-frequency sea-level oscillations controlled the deposition of the thickening- and coarsening- upward cycles;
3. an increasing of slope steepness, connected with the onset of the Flysch, triggered debris-flows supplied by nodules reworked from the lower penecontemporary unit and produced slump scars and a stratigraphic hiatus spanning from the Cuisiano sup. to the medium-upper Lutetian. The age of the marls was determined using nanoplankton biozones datations (NP15-NP16);
4. definitive ramp drowning occurred at the same time of marls onset attesting the carbonate productivity end.