

A MESSINIAN REEF AT THE NORTHERN LIMIT OF THE MEDITERRANEAN CORAL REEF ZONE (NORTHERN APPENNINES, ITALY)

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New investigations have been carried out in the area next to the village of Vigoleno (Piacenza, northern Appennines), where the presence of a Messinian coral reef was previously mentioned by Barrier et al., 1994.

Due to tectonic adjustments, the Vigoleno reef has been strongly fragmented and blocks and outcrops of different size are scattered within a 4 Km² area. However, the recent discovery of new and quite complete outcrops allowed to better describe this reef, so far the northern coral reef of the Mediterranean region during early Messinian time.

Three different facies have been recognized and described according to their biotic components (reef-building organisms, associated fauna), growth fabric and sediment types, and a depositional model is presented.

- The shelf-edge is represented by a *Porites* pillarstone and abundant coralline algae. *Porites* is largely the main reef-building coral, associated with few colonies of *Siderastraea*. In particular, columnar and rod-like *Porites* colonies characterize the upper and shallower part of this facies whereas branching morphologies, reduced in size and with thinner sticks, dominate in the lower and relatively deeper part. Coralline algal crusts are extremely abundant (*Spongites*, *Lithophyllum*) and often associated with encrusting foraminifera (*Miniacina*). These crusts strongly bind coral colonies or grow directly on the substrate forming discontinuous crustose frameworks. The associated fauna is mainly represented by benthic foraminifera, molluscs, bryozoans, echinoids, ostracods and serpulids. Intra-reef sediment consists of a packstone-wackestone.

- The proximal slope facies is characterized by a dense *Porites* sheetstone, with well developed platy colonies. Frequent but less abundant are coralline algae and encrusting foraminifera. The associated fauna is similar to the shelf-edge. The sediment mainly consists of a wackestone-packstone.

- The distal slope facies is characterized by abundant rudstone associated with a gradual but significant decrease of *Porites* colonies in growth position. Coralline algae, especially melobesioids, often form small ellipsoidal, columnar rhodoliths. The deeper part of this facies is characterized by a fine pelitic mudstone with planktic foraminifera and ostracods, including the species *Pokornyella italica*, a typical „Sahelian” marker that confirmed the early Messinian age of the Vigoleno reef.

Despite its location at the northern limit of the coral reef zone, the depositional model of the Vigoleno reef and its distinct zonation of *Porites* growth morphologies, are strictly similar to those typical of Mediterranean early Messinian reefs. Only coralline algae, very abundant with respect to other contemporaneous reef sites, suggest that the Vigoleno reef most probably developed under climatic conditions close to the critical limit for coral reef growth.

Reference

- Barrier P., Cauquil E., Raffi S., Russo A., Tran Van Huu M. (1994). Signification du plus septentrional des récifs messinien à Algues et *Porites* connus en Méditerranée (Vigoleno, Piacenza, Italie). Interim Colloquium R.C.M.N.S., Marseille 1994, Miocene Reefs and Carbonate Platforms of the Mediterranean, Abstracts, 2-3.