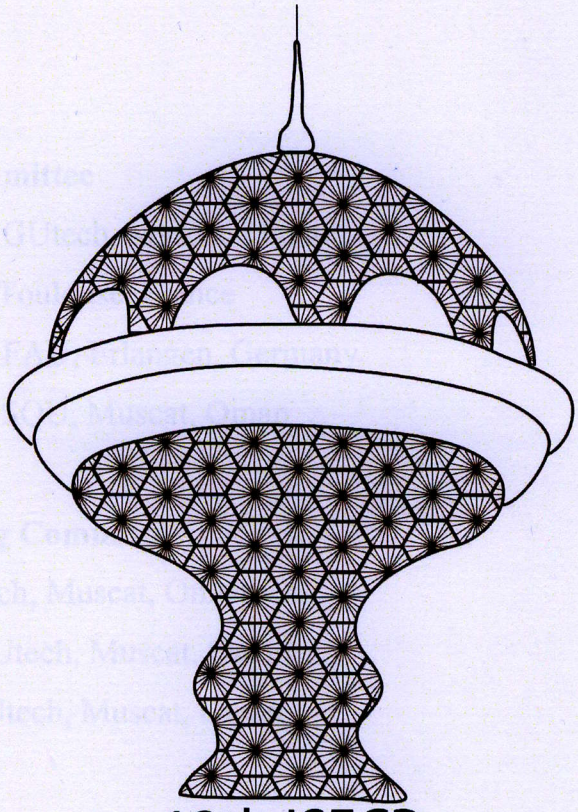

12th International Symposium on Fossil Cnidaria and Porifera 2015

Abstract Volume

GUtech Geoscience Conference Publication 2

The Middle Eocene Monte Postale succession: a new record of a greenhouse coral reef-building association (Veneto, northern Italy)

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The Monte Postale is located in the eastern sector of the Lessini Mts. (Veneto, northern Italy), close to the Pesciara di Bolca, a *Fossil-Lagerstätte* famous worldwide for its Eocene fish assemblage. Although a number of past studies on the Eocene fishes and on the associated fauna suggested the presence of coral reefs in the nearby area, so far no direct observation of preserved coral bioconstructions has been reported.

During a recent geological survey, some scattered outcrops of massive limestones were observed along the Monte Postale section. They turned out to be small bioconstructions, some meters thick, with abundant coral colonies in growth position. Detailed field mapping allowed to identify a discontinuous coral rim along the northern side of the Monte Postale, arranged as an eastward-convex arc about 200 m in length.

Preliminary facies analysis of several of these structures allowed to describe a coral boundstone, forming the core of the massive outcrops. The coral association displays a wide range of growth forms: thin platy, encrusting colonies are widespread; usually associated to abundant encrusting foraminifera, *Polystrata* and to a smaller amount of coralline red algae (mainly *Sporolithon*). The overgrowth of these organisms produced extremely compact colonizations, usually reaching some dm in width and thickness. Larger laminar colonies are also common, frequently associated to massive growth forms up to 20 cm thick. In places branching colonies are abundant, with thin coral sticks with a maximum diameter of 0.8 cm. These are most probably related to protected areas within the reef structure, characterized by relatively low hydrodynamic conditions. Coral colonies are mainly represented by the genera *Goniopora*, *Stylophora*, *Actinacis*, *Goniastrea*, *Astrocoenia* and *Astreopora*, while *Stylocoenia*, *Siderastrea*, *Pachygyra* and *Caulastrea* are subordinate. The intra-reef sediment is usually a bioclastic wackestones and sometimes a coarser *Alveolina* packstone. In both cases, dasycladacean green algae represent one of the most important bioclastic components. A coarse, stratified *Alveolina* grainstone surrounds and sometimes covers the coral bioconstructions.

New data about calcareous nannofossils allow to ascribe the lowermost beds of the section to the NP14b-NP15 (pars) or CNE8-CNE9 Zones, indicating an early Lutetian age. The site of Monte Postale thus represents a rare example of Middle Eocene true coral bioconstructions developed during the warmest climatic interval of the Cenozoic. The large amount of dasycladacean algae indicates that corals developed at very shallow-water depths, located

within the upper part of the photic zone. This interpretation is also supported by the presence of the *Alveolina* grainstone that suggests as well a deposition within some meters of depth. The evidence of a well differentiated coral association, that built a shallow-water reef structure during a greenhouse phase, is in contrast with the hypothesis that indicates a deeper, mesophotic adaptation of the reef-building coral communities during periods of warm climatic conditions.