R.C.M.N.S. Interim Colloquium

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Field Guide to the Post-Conference Excursions (Scontrone, Palena and Montagna della Majella)

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Edited by

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Excursion 2: Palena and Majella, 5th March 2011.

GEOLOGICAL FRAMEWORK OF MONTAGNA DELLA MAJELLA AND SURROUNDING AREAS

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The Montagna della Majella is an arc-shaped anticline trending NW-SE in the north and NNE-SSW in the south, made up of Mesozoic-Tertiary carbonates overlain by Messinian evaporites and marls followed by lower Pliocene siliciclastic flysch deposits (Fig. 1). In the north, the Majella Unit is tectonically covered with a by closely folded Messinian-lower Pliocene siliciclastic flysch deposits belonging to the Queglia Unit, a nappe occupying in the Apenninic edifice an intermediate position between the Majella and the Morrone-Porrara units. The northern termination of Majella beneath the Queglia Unit follows the periclinal closure of the structure controlled by the gentle plunging of the fold axis towards the NW. The southern termination, controlled by an axial plunging towards SSW, is less regular because of the occurrence of extensional faults which have re-utilized the previous thrust surface of the Morrone-Porrara Unit over Majella (see Fig. 2). Along the eastern flank of the anticline, which dips regularly towards the east (Fig. 3), basin-derived allochthonous sheets (Molise Nappes) tectonically lie over the Pliocene flysch of Majella.

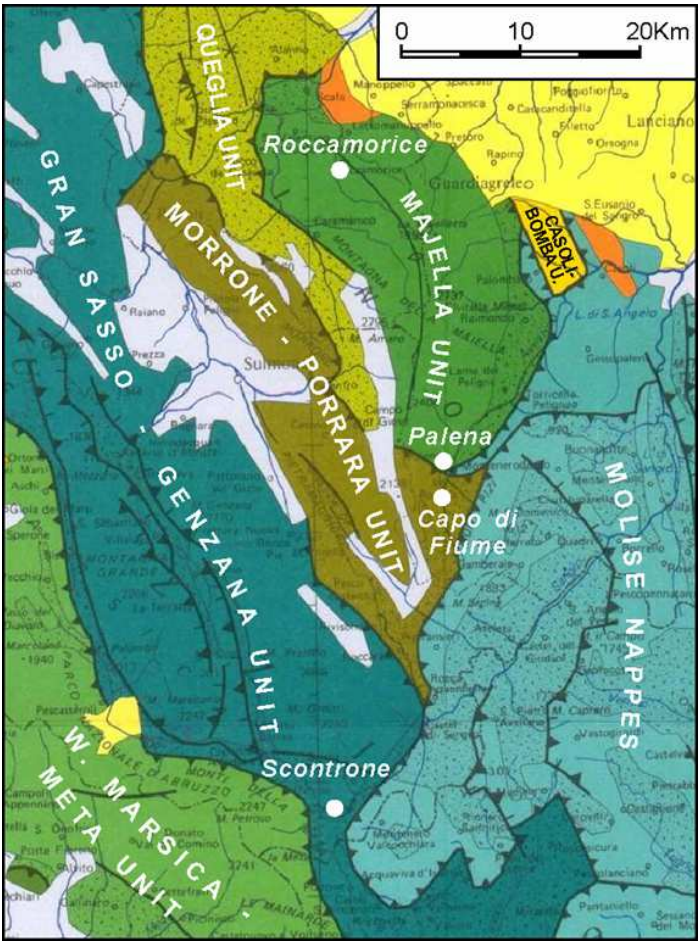


***Figure 1**. Simplified geological-structural map of the Majella and surrounding areas showing the areal distribution of the recognized tectonic units. In the different tectonic units dots indicate siliciclastic flysch deposits. Orange indicates Pliocene thrust-top deposits while yellow indicates Pleistocene deposits post-dating the nappe transport. Modified after Patacca & Scandone (2007).*

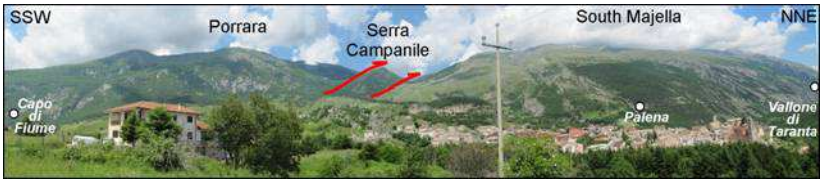


***Figure 2**. Panoramic view on the southern Majella and Porrara mountains. Serra Campanile is a splay of the Porrara thrust sheet. The thrust contact between Serra Campanile and Majella has been re-mobilized by low-angle normal faulting during the uplift of Majella. The picture also indicates the location of three sections (Capo di Fiume, Palena Cemetery and Vallone di Taranta) visited during the excursion.*

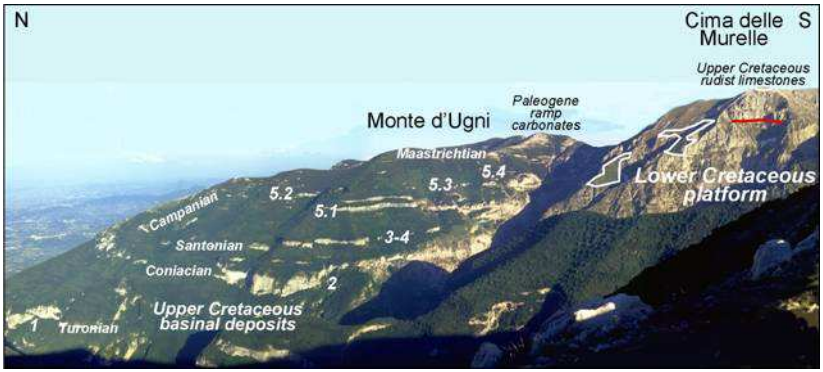
***Figure 3**. Detail of figure 2 showing the east-dipping carbonates (mostly Tertiary carbonates) in the regular eastern flank of the Majella anticline. Pliocene siliciclastic flysch deposits crop out in correspondence to the green meadow in the right hand of the picture. Palena lies on thrust-top deposits unconformably covering the Molise Nappes.*

The western margin of Majella coincides with a system of normal faults (Caramanico Fault System) displaying a maximum cumulative downthrow that exceeds 3500 metres. This fault system has been interpreted as a gravity-collapse feature that has progressively accommodated with a listric geometry the increase in the structural elevation created by a backthrust structure grown in the footwall of the Majella anticline (Patacca et al., 2008). In correspondence to the fold axis culmination, the Majella carbonates are spectacularly exposed in peaks exceeding 2700 metres in elevation (Fig. 4).

Figure 4. *Panoramic view of the Majella Mountain from west. A Lower Cretaceous-Lower Miocene section of shallow-water carbonates is exposed at Monte Amaro (2793 metres a.s.l.). A platform-to-basin transition is preserved in correspondence to Pesco Falcone. The Caramanico Fault System, highlighted by the tree line in the right hand of the picture, runs at the foot of the Mesozoic-Tertiary carbonates and its downthrow decreases considerably moving from Monte Amaro (more than 3000 metres) to La Rapina (about 1000 metres).*

As concerns the facies of the Mesozoic deposits, Berriasian-Campanian shallow-water limestones crop out in the Southern Majella area whilst Aptian-Campanian basinal deposits characterize the Northern Majella area. In addition, subsurface data show that in the northernmost area basinal conditions started from the middle/upper Liassic (Musellaro 1 well). A Cretaceous platform-to-basin transition is spectacularly exposed in Central Majella

(Crescenti et al., 1969; Accarie, 1988; Vecsei, 1991; Eberli et al., 1993; Morsilli et al., 2002; see Fig. 5).



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In this sector, a segment of the Upper Cretaceous paleoslope limiting in the north the carbonate platform is very well preserved with talus breccias that progressively filled the proximal areas of the basin allowing in the Maastrichtian the northward progradation of coarse-grained ramp calcarenites. A chronostratigraphic scheme of the Mesozoic-Tertiary deposits of the Majella Mountain along an ideal N-S section is provided in foldout 3 of this guidebook.

A comparable platform-to-basin transition is also known in the Mesozoic carbonates of the Morrone-Porrara Unit, with basinal facies developed in north-western Mt. Morrone and platform facies

developed in south-eastern Mt. Morrone and in Mt. Porrara. Exposures, however, are not so beautiful as in Majella.

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