

ABSTRACT VOLUME

Paratethys-Mediterranean Interactions

Environmental Crises during the Neogene

REGIONAL COMMISSION MEDITERRANEAN NEOGENE STRATIGRAPHY

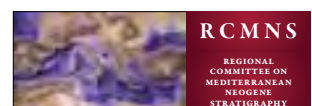


BUCHAREST, 27-30 SEPTEMBER 2012 - RCMNS INTERIM COLLOQUIUM

ORGANISED BY:



UNIVERSITATEA
DIN BUCUREȘTI
VIRTUTE ET SAPIENTIA



THE ABRUZZO-APULIAN (CENTRAL AND SOUTHEASTERN ITALY) FOSSIL FAUNA, NEW CHALLENGES FOR PALEONTOLOGISTS AND PALEOBIOGEOGRAPHERS

Masini, F.¹, Savorelli, A.². & Mazza, P.³.

¹ University of Palermo, Department of Earth and Sea Science, Via Archirafi 22, 90123 Palermo, Italy, e-mail: federico.masini@unipa.it

² University of Firenze, Department of Earth Science, Via La Pira 4, 50121 Firenze, Italy, e-mail: andrea.savorelli@unifi.it

³ University of Firenze, Department of Earth Science, Via La Pira 4, 50121 Firenze, Italy, e-mail: paul.mazza@unifi.it

Keywords: Insular vertebrates, insular colonization, endemism, Miocene, Italy

The Abruzzo-Apulian Platform was an endemic Neogene paleobioprovince. Its relics can be found at the south-east of the Italian Peninsula. Geological and paleontological traces of this past land crop out both in the central Apennines, Maiella (Scontrone fossiliferous site), as well as in the Gargano Promontory.

The Scontrone paleofauna

Scontrone is placed on the southern borderline of the Abruzzo National Park, Central-Southern Apennine. The bone-bearing sediments are coastal-tidal-flat calcarenites stratigraphically dated to the Lower Tortonian. They yielded remains of terrestrial mammals, which include the bizarre ruminant *Hoplitomeryx* and the giant insectivore *Deinogalerix*, of a large terrestrial bird, and of large crocodylians and chelonians. At present, *Hoplitomeryx*, *Deinogalerix* and the crocodylians represent the elements in common with the Gargano community.

The fauna is endemic and quite unbalanced. Six species of *Hoplitomeryx* have been described until now, but other species are adding to the list as new specimens are being freed from the calcarenites. *Deinogalerix* seems also represented by more than a single species. No mammal carnivores nor small mammals were found until now.

The Gargano paleofauna

A very diversified endemic fauna is contained in soil deposits (Terre Rosse) that fill an extensive karst

system at the north-western slopes of Mount Gargano (Southern Italy). The fossil assemblages include both large and small mammals, birds, reptiles, and amphibians, and are highly unbalanced. The small mammal component is mainly made of rodents, lagomorphs, and insectivores. Larger mammalian taxa are less abundant and are represented by Hoplitomericidae, *Deinogalerix*. And the sea otter *Paralutra garganensis*.

The fissure fillings have been arranged in a bio-chronological sequence based on their different faunal composition and evolutionary degree. During the time period documented by the fissure deposits the faunal diversity changed and several taxa underwent significant evolutionary modifications, giving rise to numerous adaptive radiations.

Taxa weakly- or non-modified compared to their continental counterparts characterize the oldest assemblages. They likely represent the youngest dispersal phase from the mainland into the insular domain, suggesting a polyphasic origin of the community.

Evidence of apparently the oldest faunal settlement in Gargano was found in the recently discovered fissure M013. It contains remains of a new murid, which is manifestly the ancestor of *Mikrotia* (the endemic and widespread murid of the Terre Rosse), together with those of a new Cricetodontinae, which resembles primitive early Miocene representatives. These occurrences, in addition to the absence of *Apodemus* and *Prolagus*, two ubiquitous taxa of the Terre Rosse fillings, confirm that the assemblages are the result of a set of successive bioevents.

The age and paleogeography of Scontrone and Gargano: the Abruzzo-Apulian domain

The Early Tortonian age of the Scontrone fauna is unequivocally proven not only by solid geologic evidence, but also by the *Hoplitomeryx* representatives, which are comparatively more primitive than their Gargano counterparts. The same might apply to the *Deinogalerix* specimens from the two localities, but analyses are still under way to check this aspect.

The Gargano fissure fillings are tentatively dated to the Late Miocene on the basis of paleontological inferences, namely the occurrence of *Apodemus*, which is supposed to be not older than MN12 in the European mainland.

The Gargano's younger age possibly reflects the fact that the Gargano palae-islands formed stable structural high, while the Scontrone area was involved in the Apennine build-up and gradually sunk. Thus, the faunas from Scontrone and Gargano represent two different time slices within the same bioprovince.

The colonization of the Abruzzo-Apulia domain

The existence, from the Late Oligocene to the Langhian, of a trans-Adriatic structural high between Dalmatia and the Gargano Peninsula, through the present day Tremiti Islands, was ascertained based on the seismostratigraphic analysis of more than 6000 kilometers of reflection seismic profiles from

the Adriatic offshore, but also on several tens of deep wells. The major 29-30 Ma global sea-level fall caused the generalized surfacing of this structure across the Adriatic. The trans-Adriatic isthmus was originally in the form of stripe of land. Then, as the sea level turned growing at the transition to the Early Miocene, the structural high likely gave rise to an archipelago of gradually shrinking islands. The isthmus definitively sank at the end of the Langhian, i.e. around 14.8 Ma, and the Abruzzo-Apulian area remained cut off from any near mainland for the next 7 million years. Dalmatia and the Gargano were connected again during the Messinian sea lowstand. Thereafter, the sea level turned gradually to rise again, at first isolating the Abruzzo-Apulian area and then finally submerging it entirely at the very end of the Messinian. The possible ways of colonization used by the Messinian colonizers is still passionately debated.

Although many steps have been made in the direction of improving our understanding of the history of the Abruzzo-Apulian Platform and of its faunal communities, yet many issues are still unanswered. Settling these issues will not only give us a better insight into the development of the Abruzzo-Apulian faunas per se, but will also lead us to a better understanding of the geo- and biodynamics of paleo-islands in general.