

Podium Presentation Session 1, Wednesday 1:50-2:10 pm

Earliest western expansion of the Uluzzian groups and the late Neanderthal occupation in southern Italy

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During the Middle to Upper Palaeolithic transition, ca. 50–40 thousand years ago Europe witnessed a crucial population turnover characterized by the replacement of Neanderthals by *Homo sapiens*. In the same chronological interval, the archaeological record offers evidence of a conspicuous, although spatially and temporally differentiated, shift in material culture and technology across the continent [1] that opens critical questions about the processes underlying modern human migrations into Europe and their chronology, on the impact of a possible interaction between *Homo sapiens* and Neanderthals, and the attribution of different techno-complexes to different human groups [1–3]. In this context, the Italian Peninsula plays a pivotal role due to its geographical position, broad environmental diversity [4], and richness of archaeological evidence [1,2]. However, only a handful of Neanderthals and modern human remains dated between ~50 and ~40 ka have been found in Italy, thereby preventing a comprehensive overview of the relationship between these two species.

In this study, we show the most recent direct evidence of Neanderthal presence and the oldest date for the Uluzzian techno-complex in southwestern Italy by generating new dates and taxonomic attributions of two human teeth documented at Rocca San Sebastiano (Mondragone-Caserta, Italy) [5]. We used morphological analysis, morphometric analysis, and a variety of supervised learning algorithms (Flexible Discriminant Analysis, Multiadaptive Regression Splines, Random Forest) on the cervical and crown outlines of the two samples.

We attributed RSS1, a left second lower deciduous molar found above a level that we dated to 44,810–44,230 cal BP (1σ), to a Neanderthal individual based on all the obtained posterior probabilities, as well as on the presence of a bucco-distal enlargement and a convex lingual side (from the occlusal view), and a complex morphology in the occlusal aspect of the EDJ (i.e., protostylid, anterior fovea and mid-trigonid crest).

The second specimen RSS2 is a left second lower deciduous molar which was found in stratigraphic continuity with a predominantly Uluzzian deposit that we dated to 42,640–42,380 cal BP (1σ). The tooth presents with a crown outline characterised by bucco-distal narrowing, straighter lingual side, and a complex morphology in the occlusal aspect of the EDJ (i.e., crests in the mid-occlusal basin, but absence of MTC), all of which make it closer to both archaic Pleistocene and recent human samples. All supervised learning algorithms consistently attributed it to *Homo sapiens*.

Rocca San Sebastiano therefore offers direct evidence of a late presence of Neanderthals in southwestern Italy, followed by a later shift to Early Upper Palaeolithic technology compared to the Uluzzian evidence documented at Grotta del Cavallo (Puglia, Italy).

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