

## A technological and functional examination of the Aurignacian end-scrapers from Grotta di Fumane

Alessandro Aleo<sup>1</sup>, Rossella Duches<sup>2</sup>, Veerle Rots<sup>3,4</sup>, Marco Peresani<sup>1</sup>

1 - Università di Ferrara, Dipartimento di Studi Umanistici, Sezione di Scienze Preistoriche e Antropologiche · 2 - MUSE - Museo delle Scienze · 3 - Chercheur Qualifié du FNRS · 4 - TraceoLab/Prehistory, University of Liège

End-scrapers are tools widespread during all the Upper Paleolithic; they are manufactured retouching a blade or a flake extremity and used mainly for working hide, bone or wood. The analyzed tools were recovered at Fumane Cave, located in the Monti Lessini, part of the Veneto Pre-Alps, in the northeast of Italy [1].

The cave presents traces of intense and repeated human occupation. Protoaurignacian living floors are documented in A2 and A1, dating 14C: 35850±310 - 34180±270 BP; evidence of Aurignacian occupation is attested in the upper layers of the macro-unit D, dating 14C: 33890±220 BP [3]. In layer A2, dwelling structures are represented by large hearths, dumps of butchered and consumed herbivore carcasses and stone flaking waste. Finds in layers D include bone and antler tools, painted stones, accumulations of ochre and molluscan shells [2].

The studied assemblage consists of 203 end-scrapers. Most of them come from the Protoaurignacian levels, 132 tools; fewer from Ancient Aurignacian ones, 71 tools. Technological, typological and functional analysis were performed on the items. The raw material used is the high quality flint abundant in the Lessini mountains: the main one is Maiolica, followed by Scaglia Variegata and Scaglia Rossa. The tools are manufactured on blanks from the whole laminar débitage especially blade and other regular débitage products but also on shorter flakes. Most of the end-scrapers are made of regular supports with a reduced thickness, slightly convex profile, axial and distal active part mostly characterized by intense resharpening. Typologically long frontal end-scrapers are the most numerous, carinated and nose form (typical of the Ancient Aurignacian) are very less represented.

The functional study has been carried out in collaboration with the TraceoLab of Liege. Both macro and microscopic traces were considered; tools were analyzed with a stereoscopic microscope (low power approach) and also with a metallographic microscope using bright field illumination (high power approach). Thanks to the good state of preservation of the tools, a large number of use-wear traces were detected and compared with the reference collection. Traces are comparable with action of shaving and scraping soft material like hide; the analysis of the edges reveals the presence of hafting arrangement on some scrapers [4,5]. The presence of ochre on the front of the scrapers could be related to its use during the process of hide working, the one on the edges may be linked to the hafting.

The study of lithic assemblage shows a continuity among the levels A and the levels D. The scrapers share the same technological, typological, morphological and functional features. Therefore it could be possible to attribute the lithic production of levels D at the Protoaurignacian too, instead of Ancient Aurignacian. Use-wear analysis reveals a high specialization of these tools used almost exclusively in the various stages of hide working. The data supports the argument that these scrapers were not involved in the production of bone and ivory tools founded in Aurignacian layers D. Future studies could highlight which kind of tools were used for producing these objects.

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