

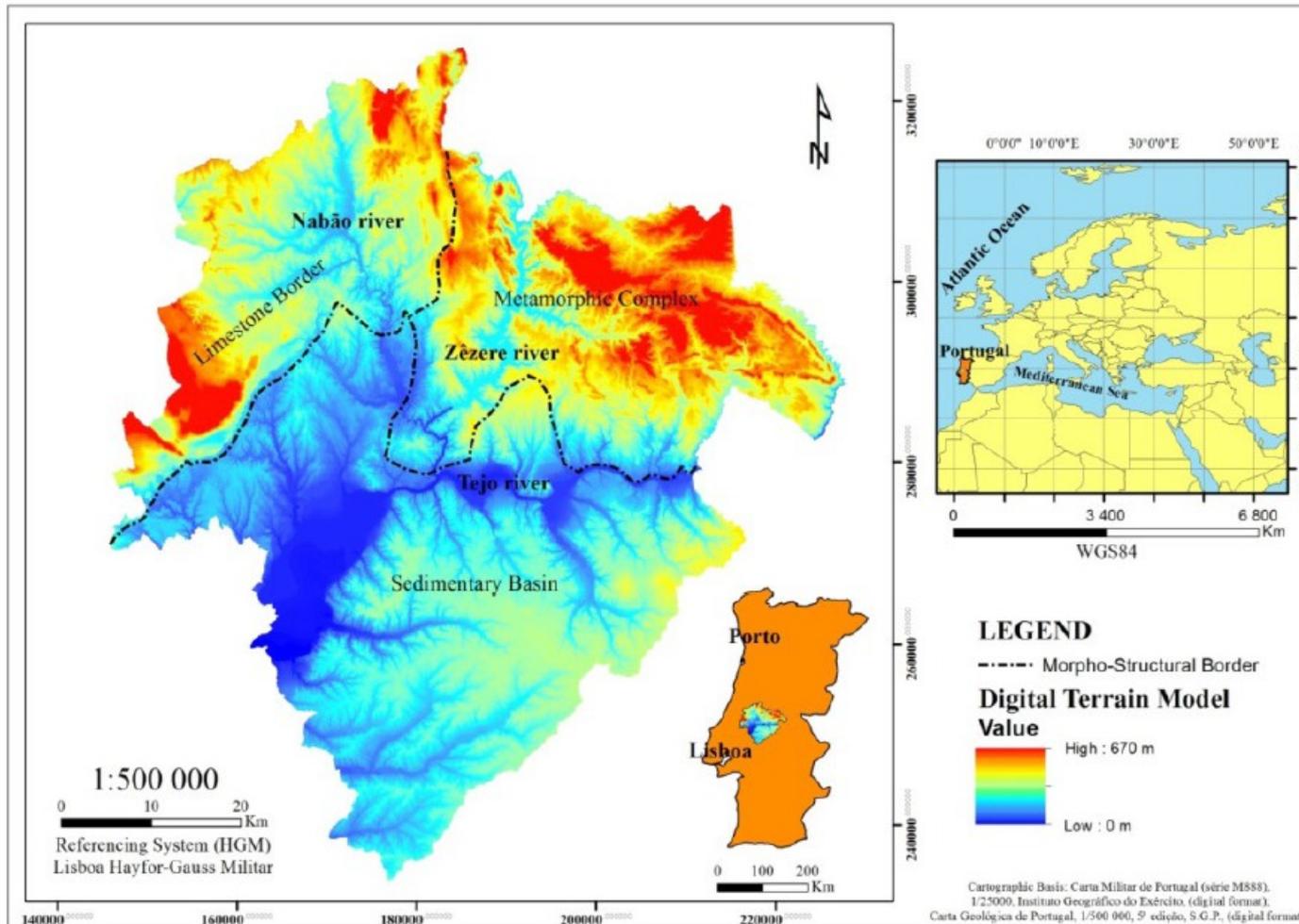
Use wear analysis of lithic tools:

the example of the arrowheads from Gruta do Morgado Superior.



Gabriele L. F. Berruti, Ana Cruz, Ana Graça.

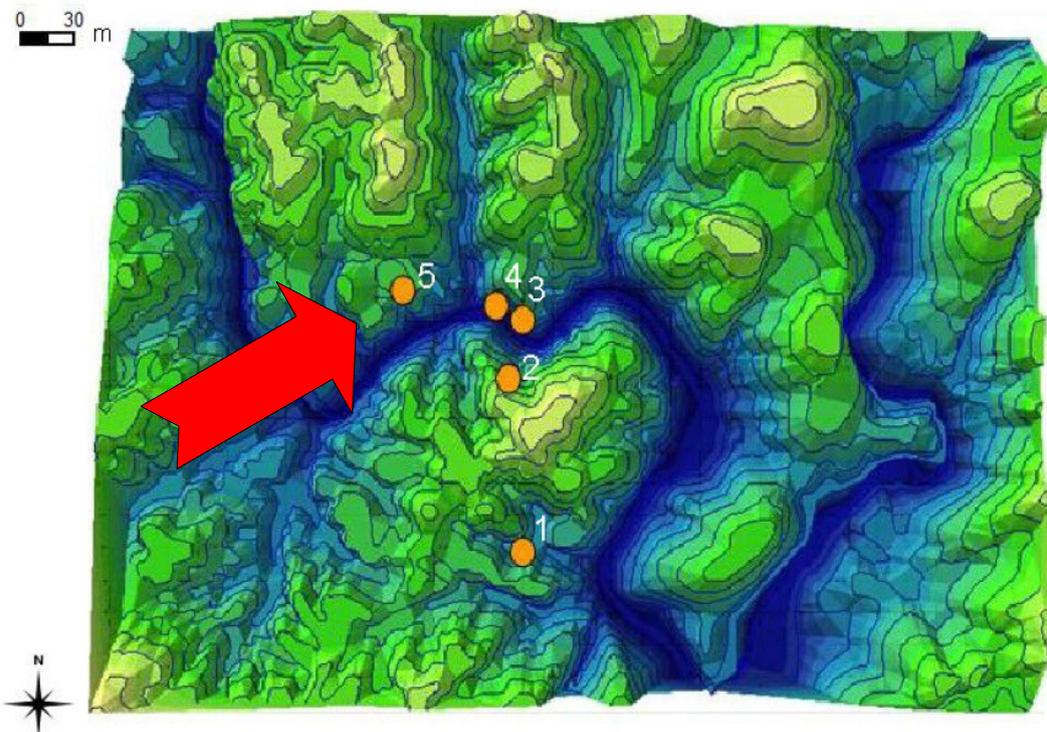
Gruta do Morgado Superior



Alto Ribatejo. Fonte: João Belo, 2011 (cortesia de Nelson Almeida, 2012)

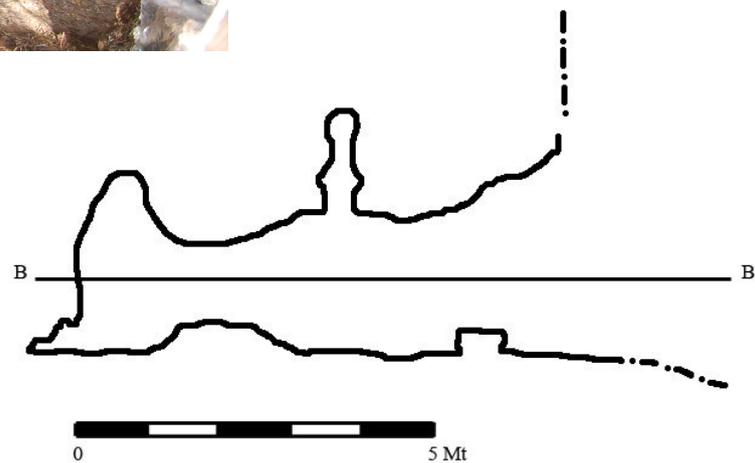
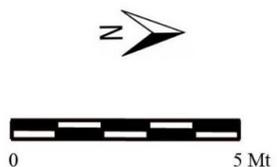
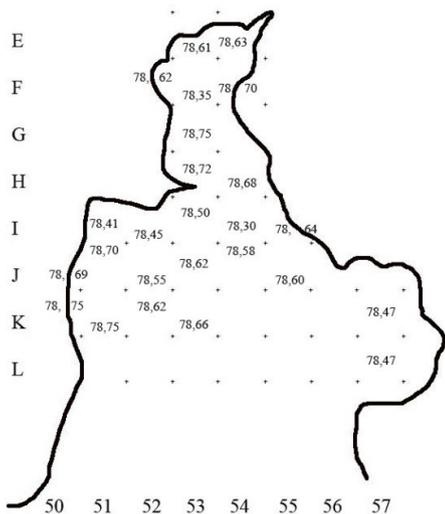


Gruta do Morgado Superior

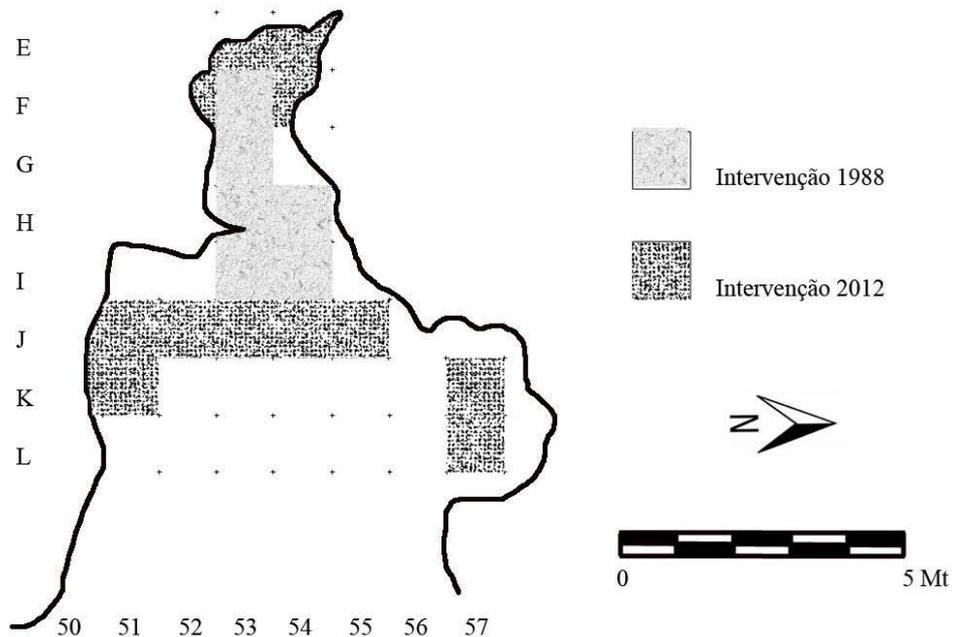


1. Gruta do Caldeirão;
2. Gruta do Cadaval;
3. Gruta dos Ossos;
4. Gruta de N^a Sr^a das Lapas;
5. Gruta do Morgado.

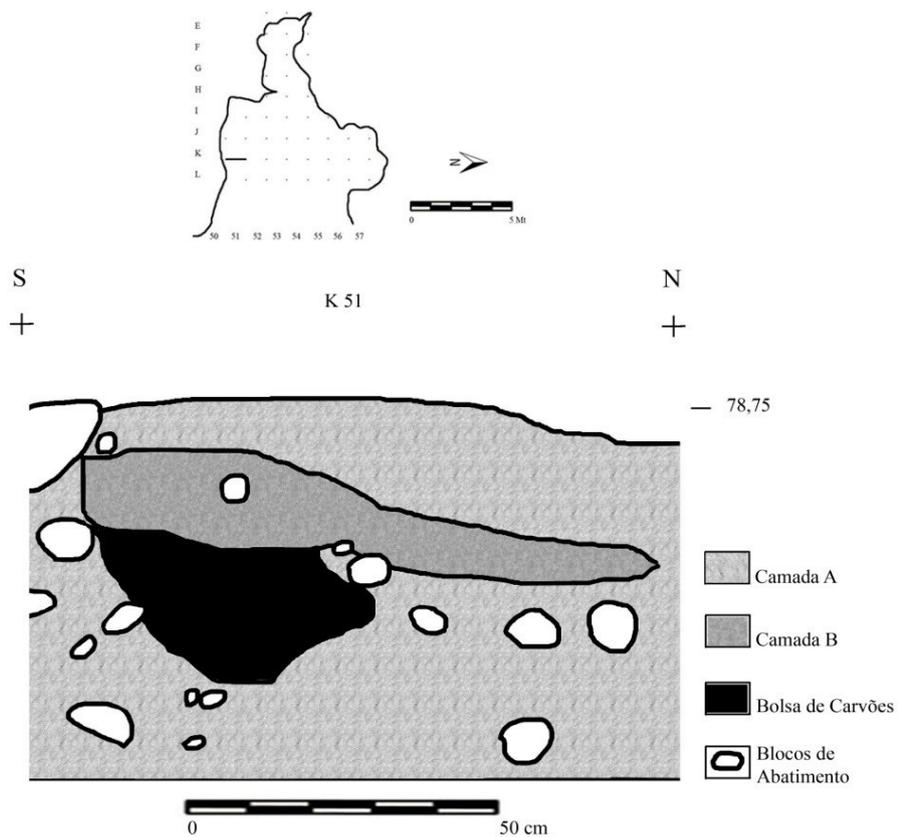
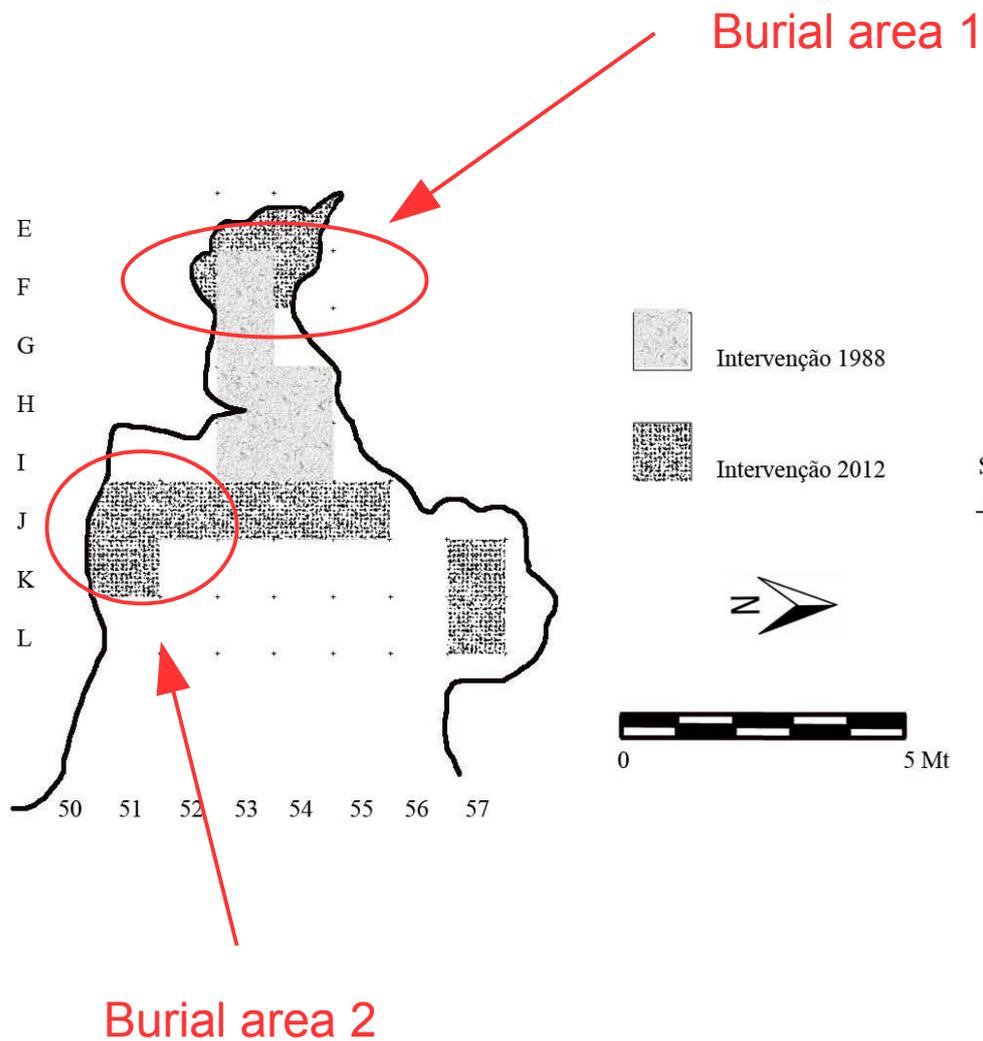
Gruta do Morgado Superior



Gruta do Morgado Superior



Gruta do Morgado Superior

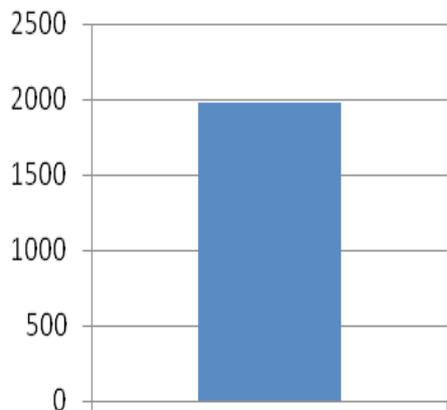




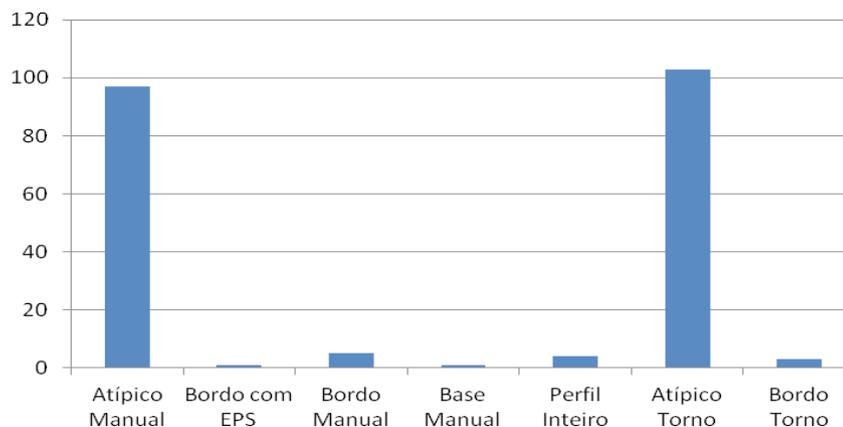
Gruta do Morgado Superior

2012 excavation

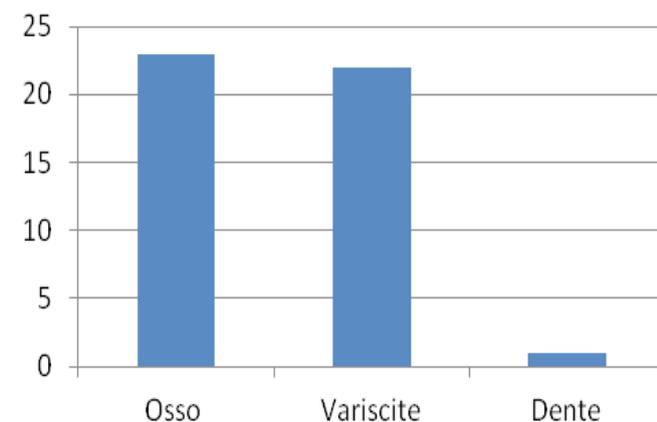
Ossos Humanos



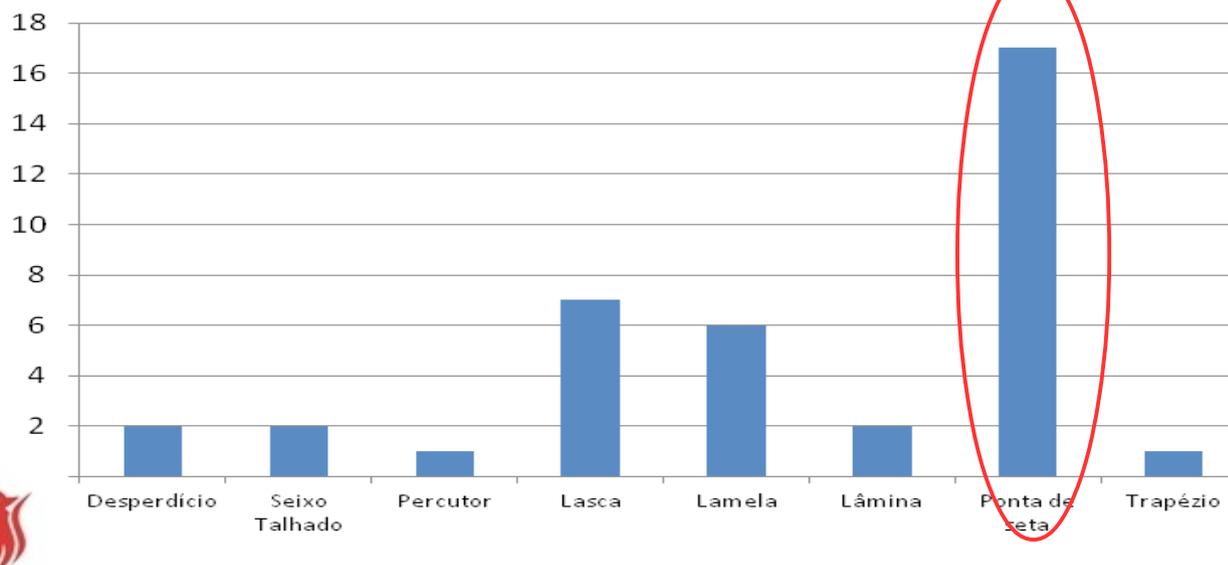
Tipos de Cerâmica



Adornos



Indústria Lítica





Gruta do Morgado Superior

Arrowheads

Our questions about the arrowheads of the Gruta do Morgado Superior:

1- These artefacts were made only for the burial rituals or were everyday objects?

2- Were they placed intentionally in the burial areas?

3- Can they give us some informations about the lifestyle of the people who made them?





Gruta do Morgado Superior

Materials and Methods :

This study was conducted by applying the low power approach for the identification of the impact fracture; like similar study conducted by several authors (Fischer et al 1984; Lombard 2005, 2007; Pargeter 2011; ecc...).

For the analysis we use one stereo microscope Seben Incognita III with magnification from 10x to 80x and one digital microscope Dino-Lite Am413T with magnification from 5x to 250x.

We analyzed all the arrowheads from the excavations 2012-2013 for a total of 38 arrowheads.



Seben Incognita III



Dino-Lite Am413T



Gruta do Morgado Superior

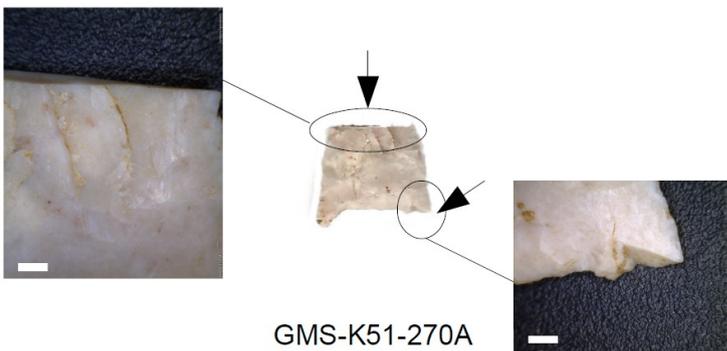
Materials and Methods :

Summary data on the four main impact fracture (IF) types (step terminating bending fractures, unifacial spin-off fractures >6 mm, bifacial spin-off fractures and impact burinations). Summary data on three commonly recorded, non-'diagnostic', impact fractures (feather and hinge terminating bending fractures and snap fractures) are also presented. Illustrations of these fracture types are adopted from Fischer et al. (1984) and data derived from Lombard (2005) and Pargeter (2011a,b).

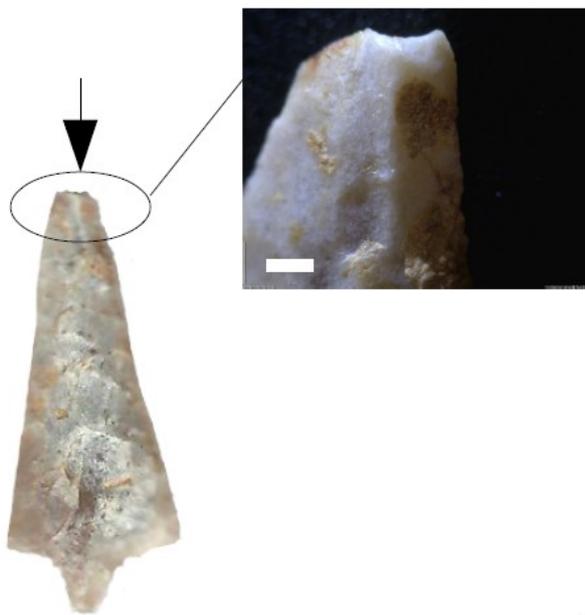
Fracture	Description	Illustration
Step terminating bending fracture (IF)	A bending fracture terminating in a 90° step.	
Spin-off fracture (bi and unifacial) (IFs)	A secondary fracture type originating from bending fractures such as step terminating or snap fractures. Spin-off fractures tend to have a feather-like termination and are concave in profile. These can be bifacial or unifacial. Only unifacial spin-off fractures >6 mm are considered in final impact fracture counts in this analysis.	
Impact burination (IF)	A bending fracture resembling a burin spall terminating in either a 90° step, feather or hinge on the lateral side(s) of a tool. These are distinguished from intentional burination by a lack of negative bulbs of percussion and crushing near the proximal ends.	
Feather terminating bending fracture	A bending fracture terminating in an acute angle or in a curve less than 90°.	
Hinge terminating bending fracture	A bending fracture terminating in an upturned curve or lip.	
Snap fracture	A bending fracture in which the bending forces act to snap the tool in a clean break.	

Gruta do Morgado Superior

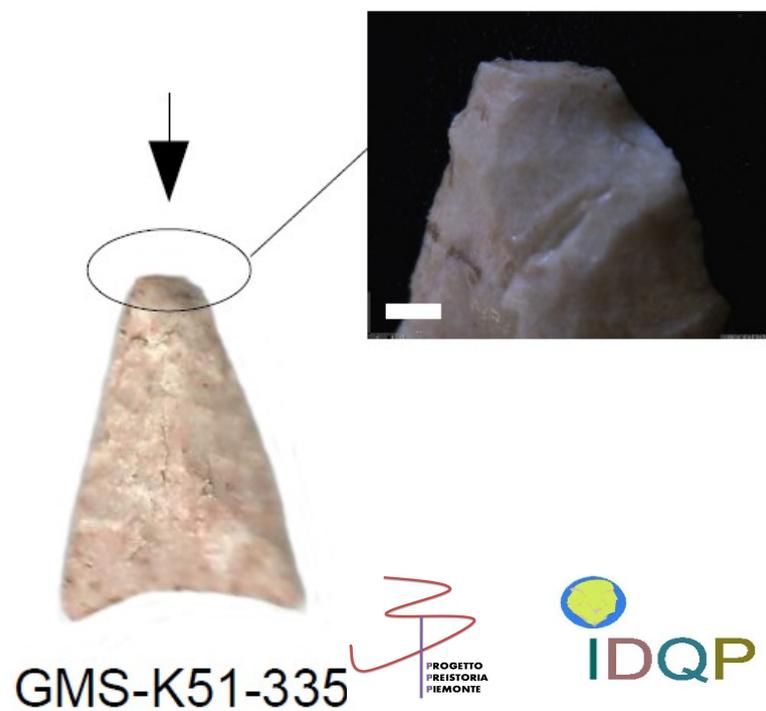
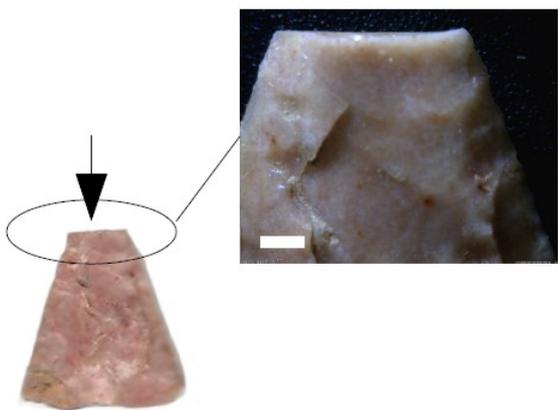
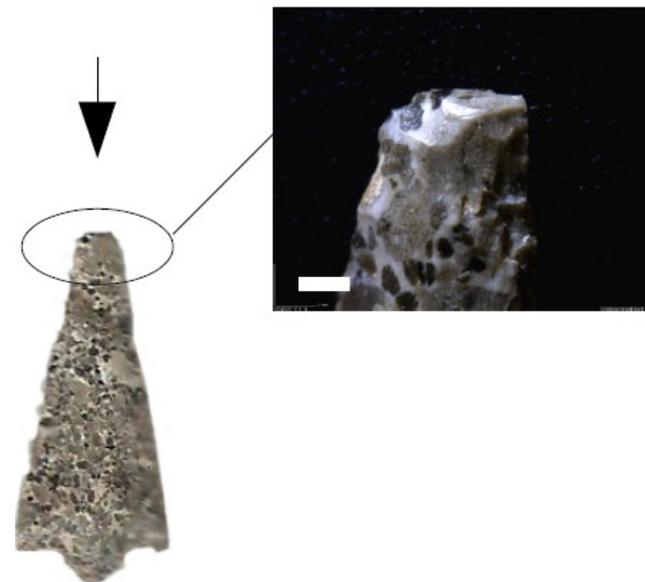
Analysis



GMS-K51-270A



GMS-J54-4



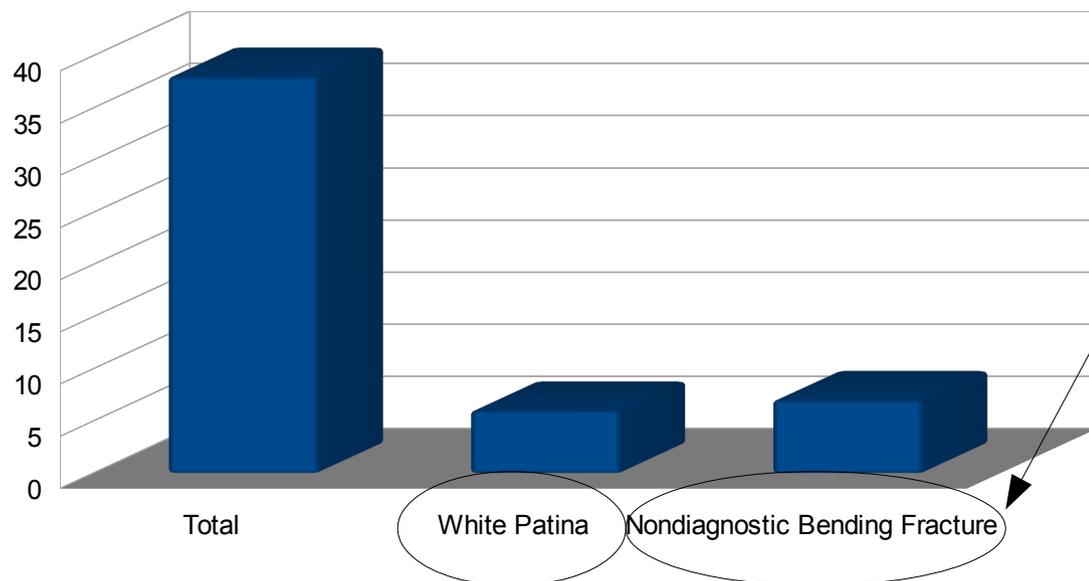
GMS-K51-335



Gruta do Morgado Superior

Analysis

Post-depositional alteration



Probably caused by the continuous reuse of the two burial areas (Fischer et al., 1984; Pargeter, 2011).

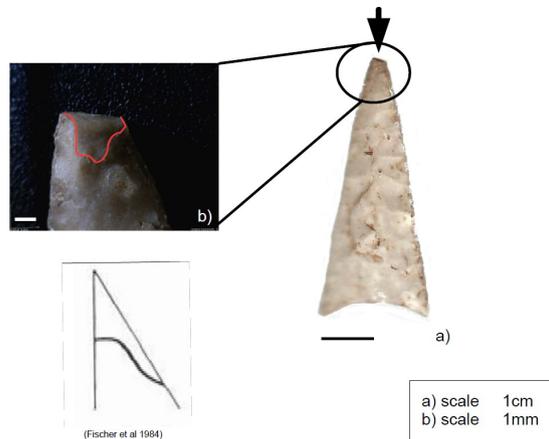
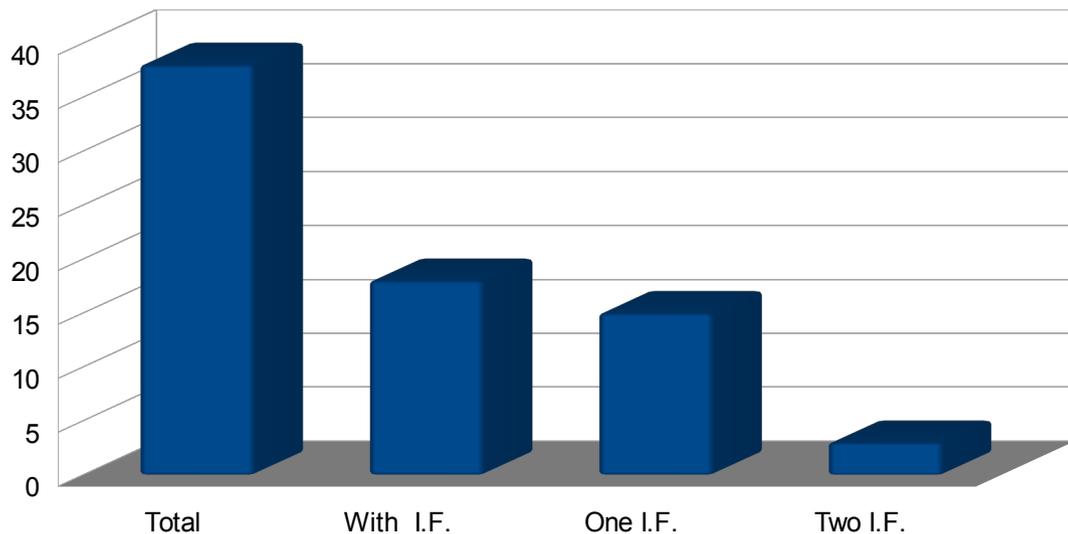
Alteration caused by chemicals agents dissolved in the sediment (Lemorini 2007; Keleeley, 1980; Ziggiotti 2008).



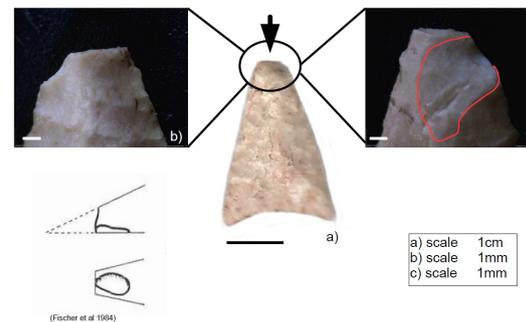
Gruta do Morgado Superior

Analysis

Number of I.F. identified



GMS K51 335





Gruta do Morgado Superior

Analysis

Position of the I.F.

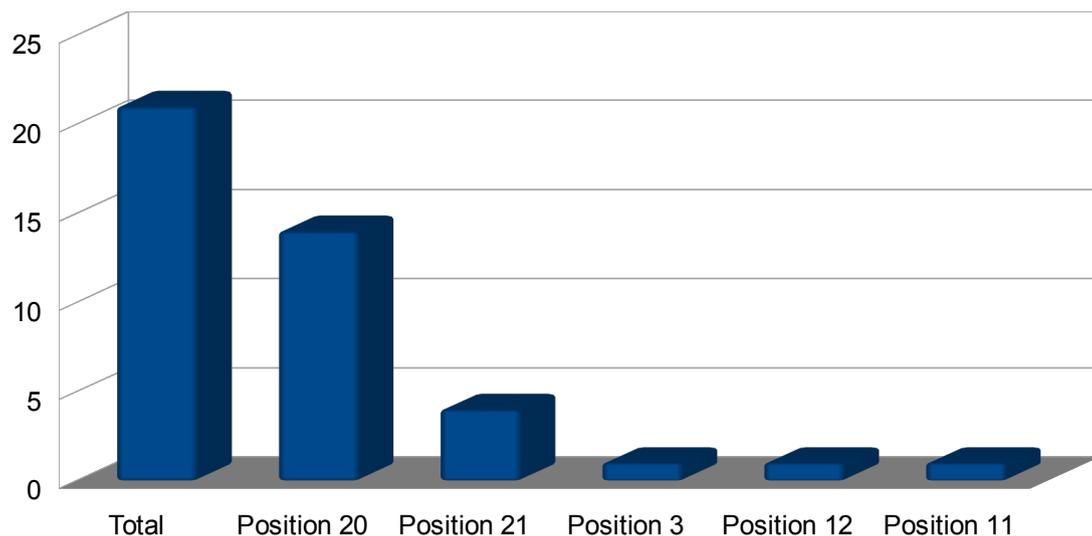
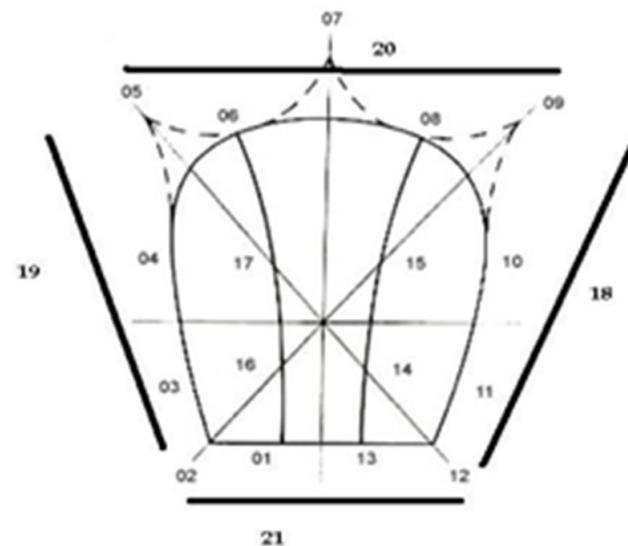


Diagram of polar coordinates used for the localization of the I.F.



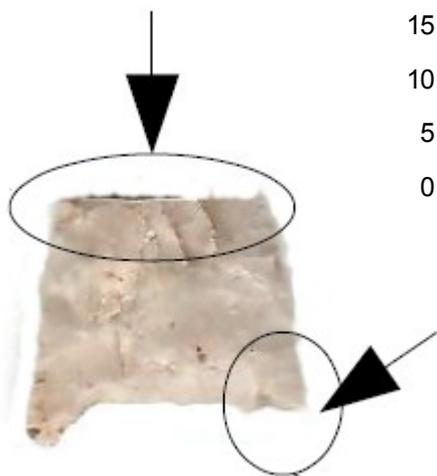
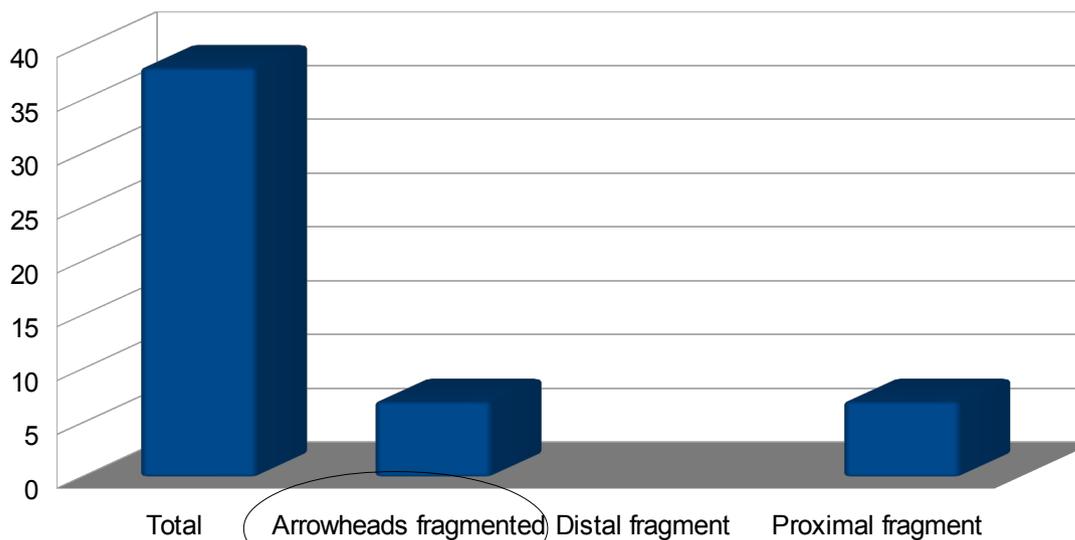
Van Gijn, 1980 - Modified by Ziggiotti 2008 and Berruti 2009



Gruta do Morgado Superior

Analysis

Fragmentation



In this category are represented artifacts which have less than the 80% of the original volume.

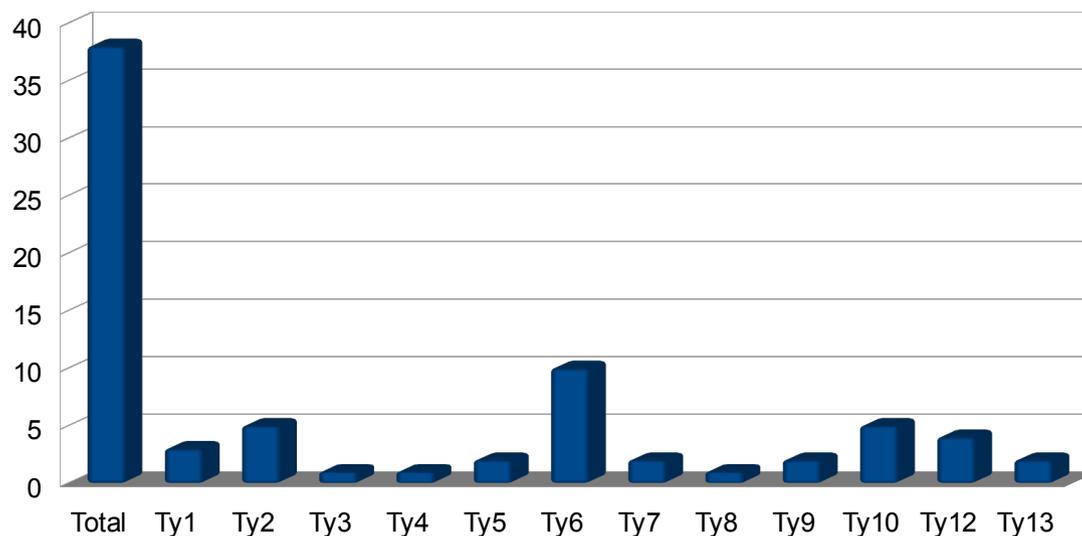
Gruta do Morgado Superior



Analysis



Arrowheads divided for different hafting system

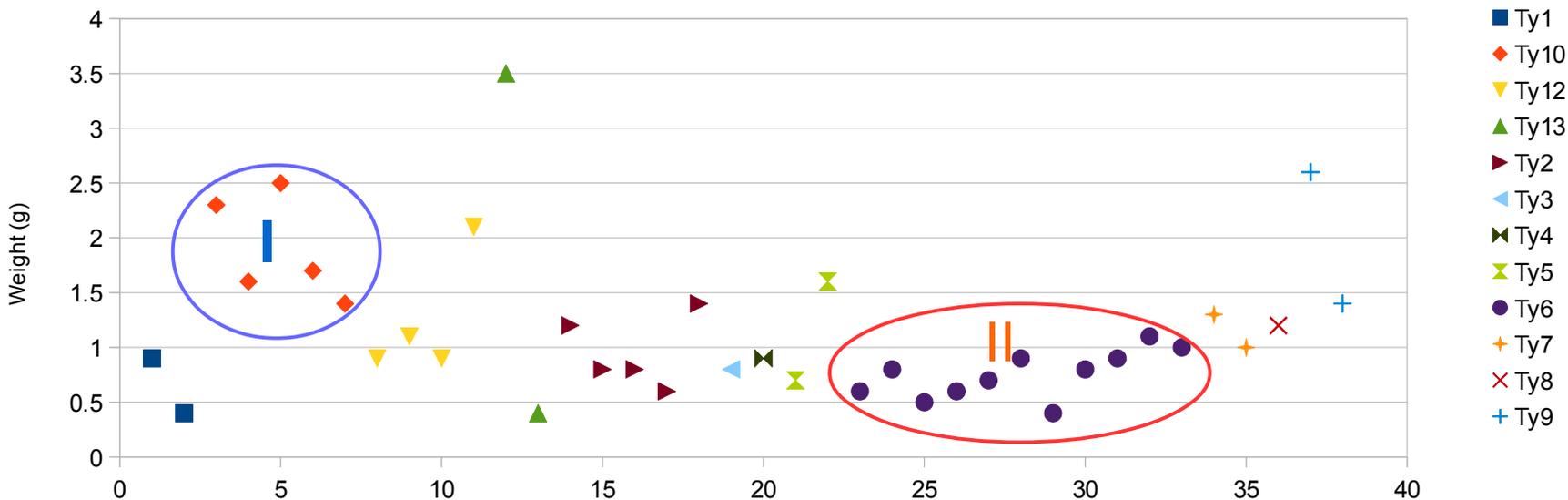




Gruta do Morgado Superior

Analysis

Arrowheads Tipology vs Weight



Ty 10

GMS-K51-420



Ty 6

GMS-J54-4

Gruta do Morgado Superior

Discussion



GMS-K31-420  •The 44% of the arrowheads of the Morgado Sup. Cave have impact fractures. .

GMS-K31-420  •These artifacts are made for the everyday use and only subsequently deposited as grave goods. The complete absence of distal fragments of arrowheads suggests that some arrowheads have been deposited without the apical part. This data suggests a strong symbolic value of the arrowheads that was not lost after their breakage.

GMS-K31-420  •We know that the typology of hafting and the weight of the arrowheads is connected with the kind of prey, the bow power and the sort of hunting (Ashby, 2005; Brizzi, 2005,2007; Brizzi & Loi 2011; Stodiek, 1990). The presence in our sample of two homogeneous groups (I and II) of arrowheads with the same weight and the same hafting system lead us to presume the presence of two different hunting methods (Churcill, 1980).



**Thanks for your
attention !!!!**

