



Archaeobotanical analysis in sedimentation deposits of Roman and Medieval pits in caves of the NW Iberia: Cova do Xato and Cova Eirós (Lugo, Galicia, Spain)

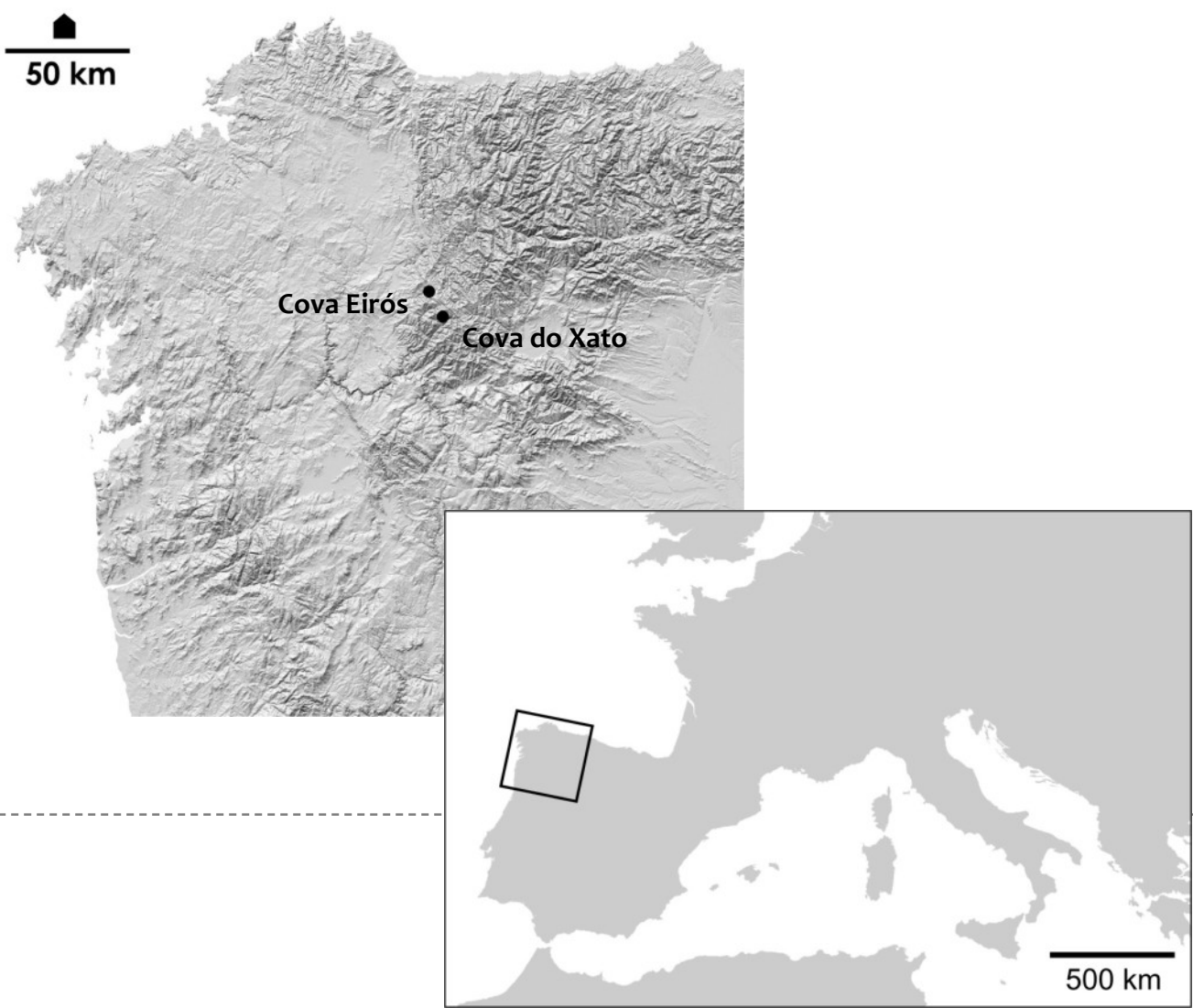
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Introduction

During the Pleistocene period there were several inhabited caves in limestone areas in the eastern province of Lugo (Fábregas et al 2008, 2009). Some of these caves and rock shelters had also been occupied during the roman and medieval periods (Fábregas et al 2008, 2009; Gómez & Vázquez 2009). The results of the archaeobotanical analysis from Cova do Xato and Cova Eirós show not only the changes in the landscape, but the different uses of vegetable resources.



Method and samples

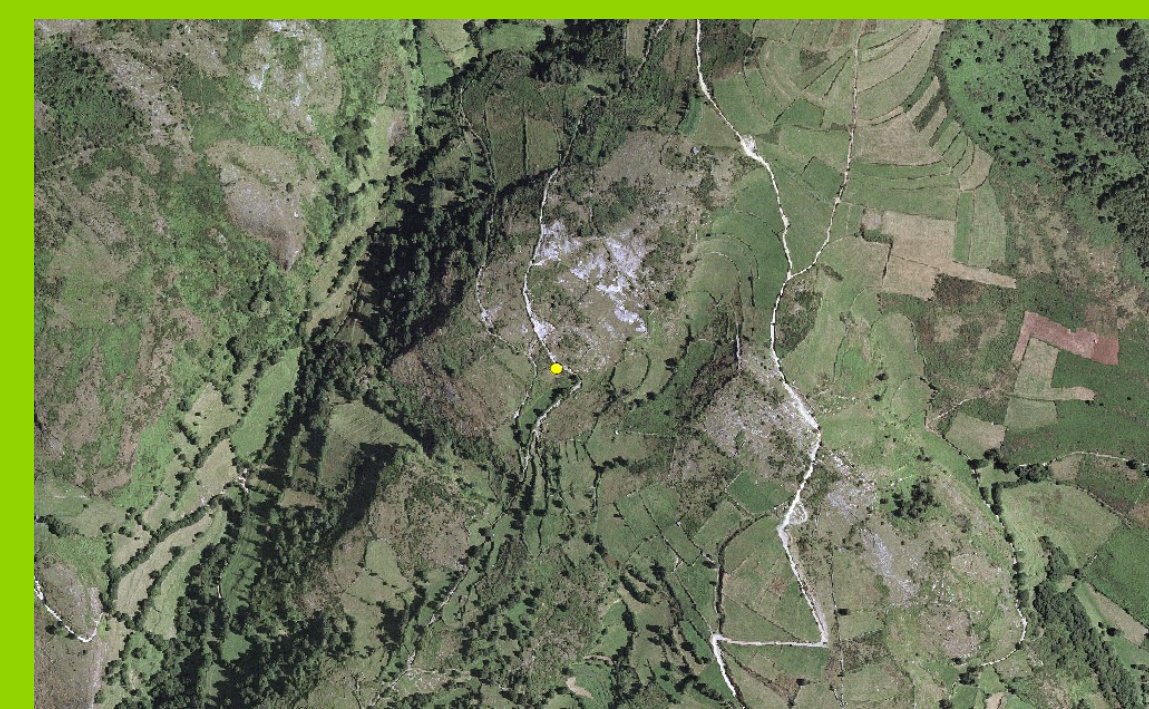


During the archaeological excavations sediment deposits, which contained charred remains, were analysed and large charcoals collected.

The sediment samples -39.5 litres in Cova do Xato and 10 in Cova Eirós- were processed by flotation in meshes of 2, 1 and 0.5mm of light.

Also two pollen analyses were carried out; even though the ones from Cova Eirós did not bring back positive results, due to conservation problems.

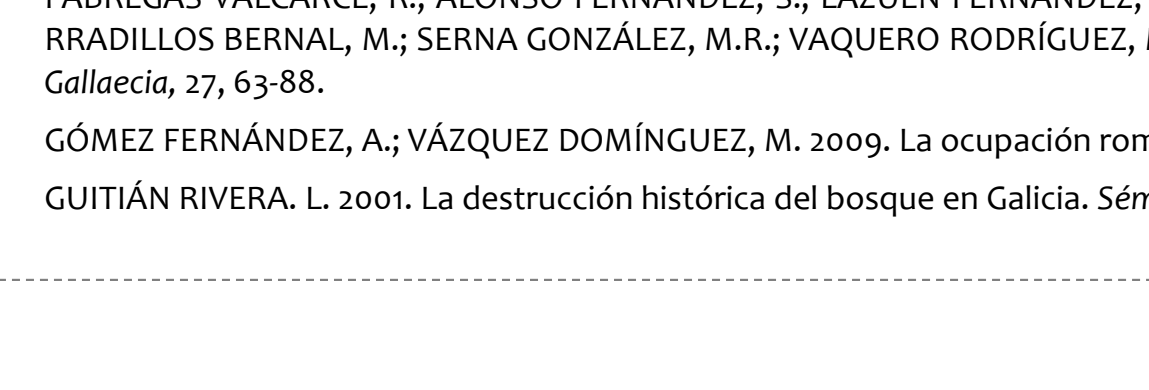
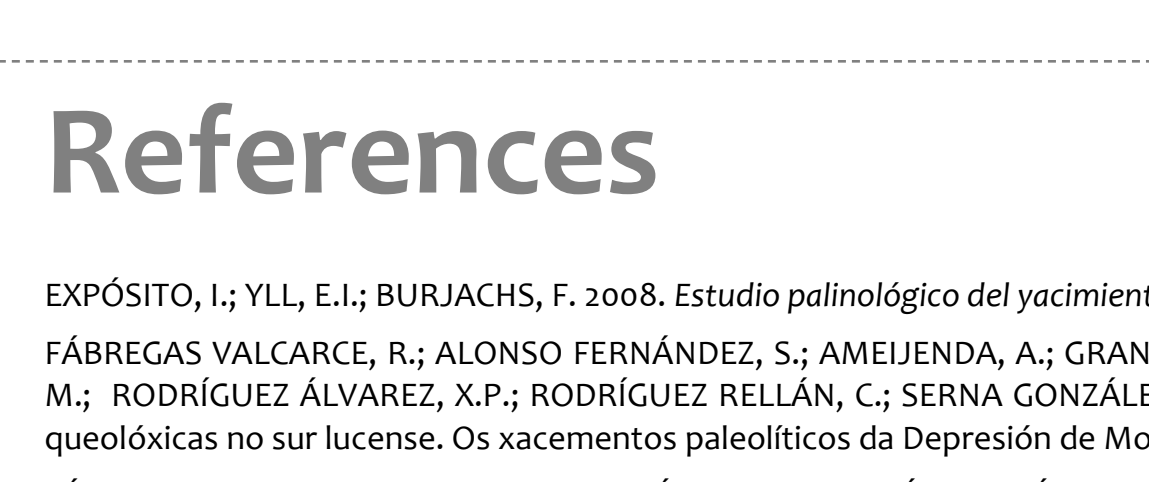
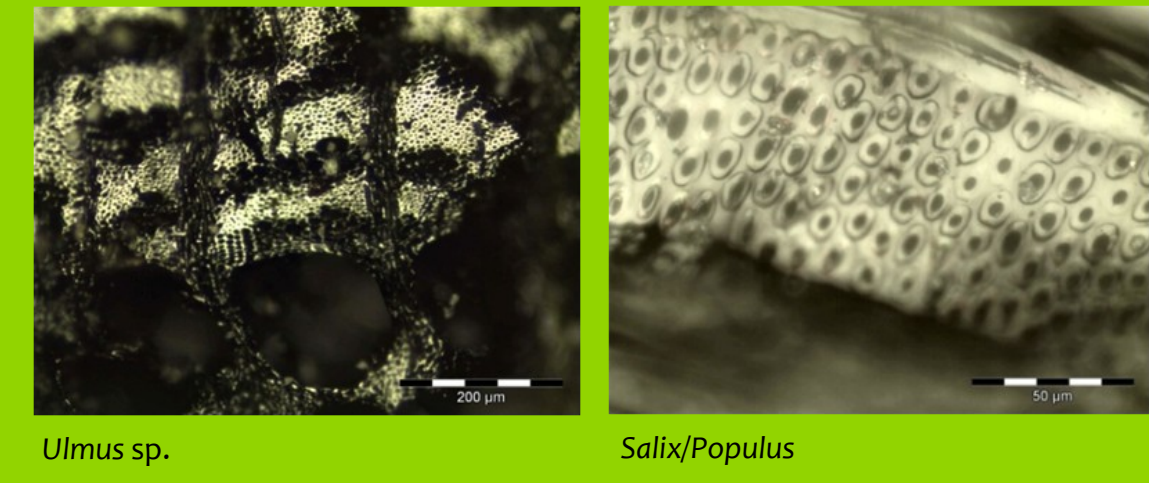
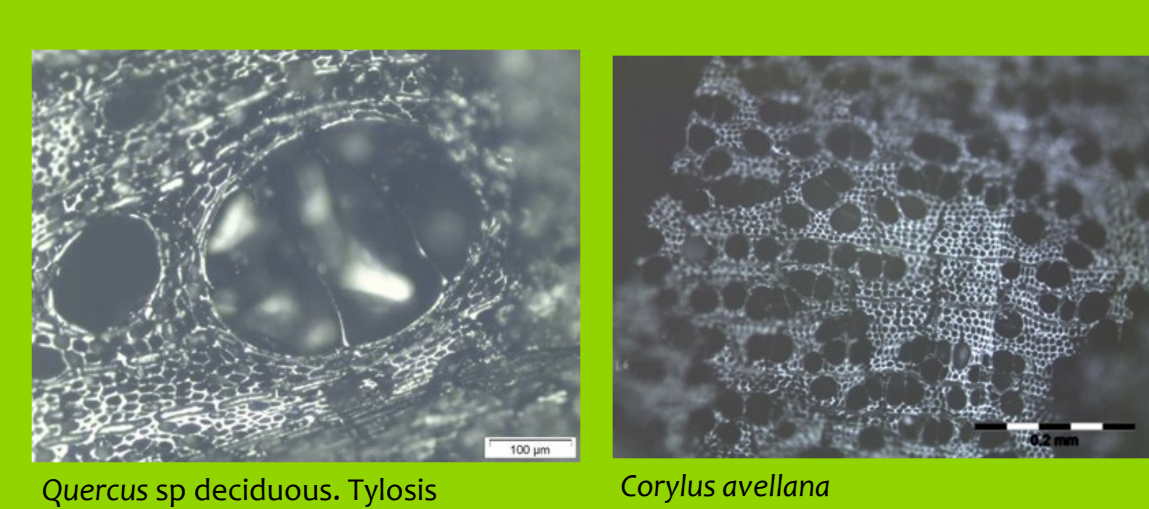
Cova do Xato



Geographical location: Folgoso do Caurel , Lugo, Galicia, Spain
EPSG:4326-WGS84: -7.135448, 42.681851

Chrono-cultural assignment:
Upper Pleistocene period
Roman period (IV-V AD)

Biogeographic region: Eurosiberian
Altitude: 1.080 m



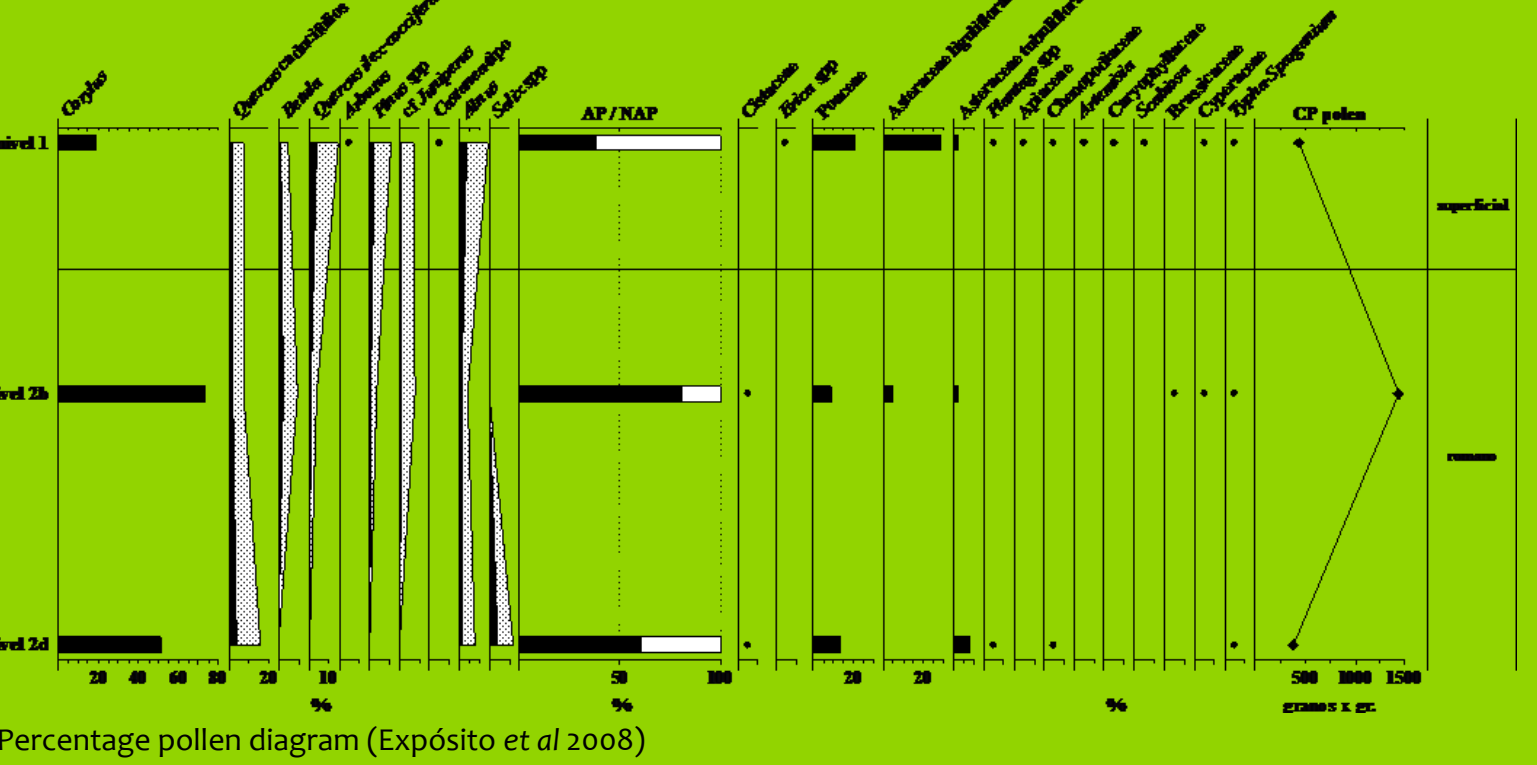
Results

The charred remains found in one of the archaeological surveys appeared in a hearth of Roman origin (IV-V AD) located near the entrance of the cave. The charcoals recovered range from 0.3 to 2 cm in size.

Roman Era	Method	TOTAL
Taxon	Flotation	N° %
Quercus sp. deciduous	98	98 66,7
Fabaceae	15	15 10,2
Fraxinus sp.	14	14 9,5
Corylus avellana	11	11 7,5
Salix/Populus	2	2 1,4
Rosaceae/Maloideae	2	2 1,4
Prunus sp.	2	2 1,4
Ulmus sp.	1	1 0,7
Arbutus unedo	1	1 0,7
Indeterminable	1	1 0,7
TOTAL TAXONS	9	9
TOTAL FRAGMENTS	146	146 100

Quercus sp. deciduous is the most predominant among the species found, followed by Fabaceae, Fraxinus sp., Corylus avellana and other species less numerically represented. In 75.2% of the remains of Quercus sp., Fraxinus sp. and Ulmus sp. tyloses were registered. Quercus sp. also showed radial cracks and vitrification in 19.2% and 8.2% of the remains. Medium and large size branches, as well as oak trunks were the most common type of firewood used (according to the curvature of the tree-rings).

The pollen analysis has proved positive in three archaeological levels (Expósito et al. 2008); two of them chronologically related to the level of charcoals (level 2b and 2d). In the pollen samples, firewood appears in 81% and 60.8% of the cases, particularly Corylus avellana (73.3% and 51% of the total). There are other tree and shrub species less represented such as Alnus sp., Betula sp., cf Juniperus sp., Quercus sp. deciduous, Quercus sp. evergreen, Salix sp. and Cistaceae, all between 3.9%-1% of the total.



Conclusion

The results of charcoal analysis show a diversified exploitation of the environment; trees, shrubs and bushes typical of deciduous forests appear, always associated with streams and scrub areas. Those species due to their combustion-resistant characteristics are good as firewood (producing lasting embers), which combined with some faster burning ones produce even abundant flames. The reasons behind selecting these species were: their proximity to the caves and properties as firewood; they could have also been collected when fetching water or harvesting wild fruits.

Geographical location: Triacastela, Lugo, Galicia, Spain
EPSG:4326-WGS84: -7.203732, 42.766641

Chrono-cultural assignment:
Lower, Middle and Upper Pleistocene period
Middle Ages

Bio-geographic region: Eurosiberian
Altitude: 780 m

Results

The charred remains appeared in a store-pit (UA1) of medieval chronology in Cova Eirós. 11 taxons from tree, shrub and bush species were identified. Due to the curvature of the ring and anatomical characteristics the taxons would belong to small and medium size branches, while large branches and logs would be less represented. In 76% of the species with secondary structures tylosis were registered.

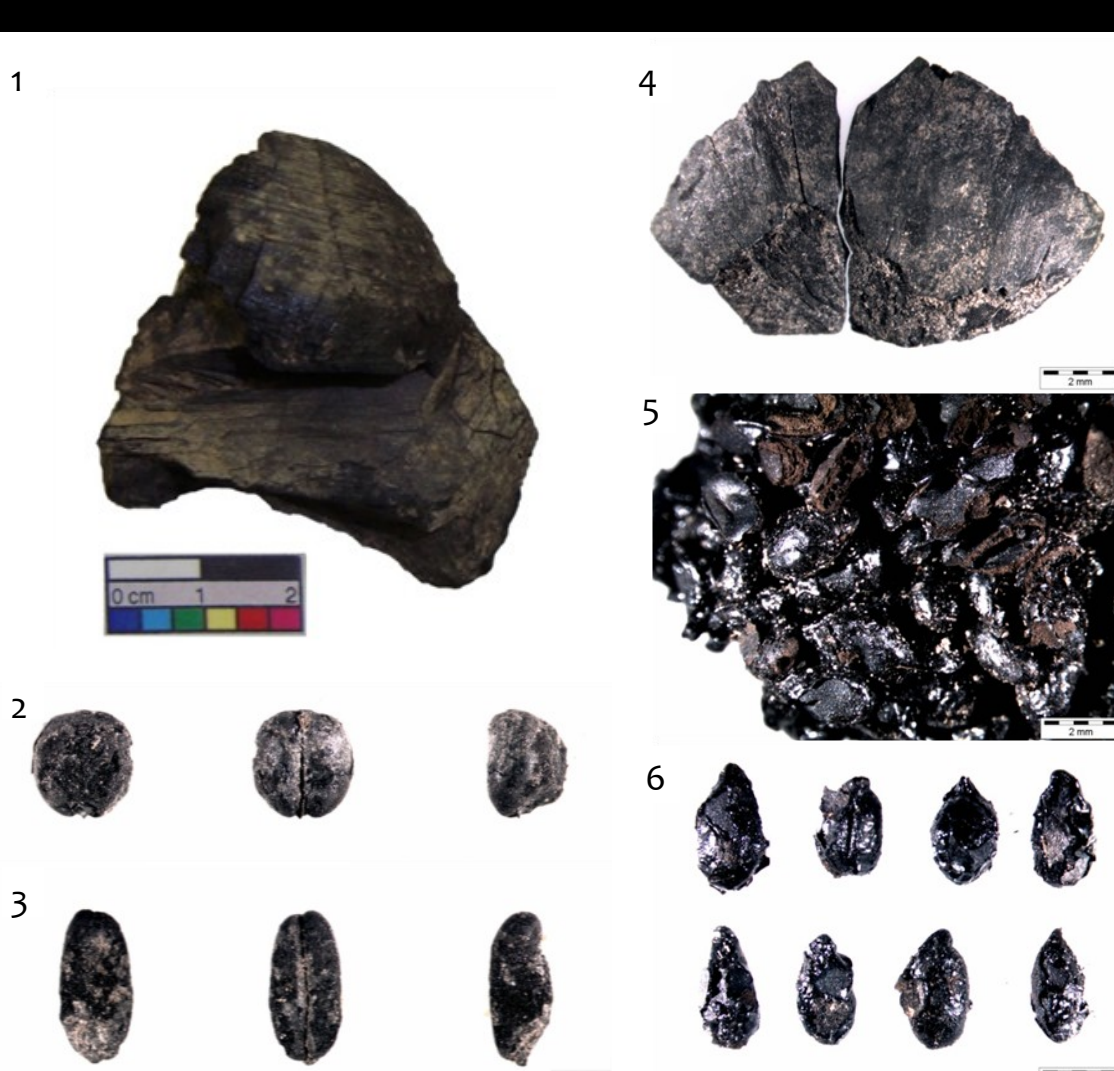
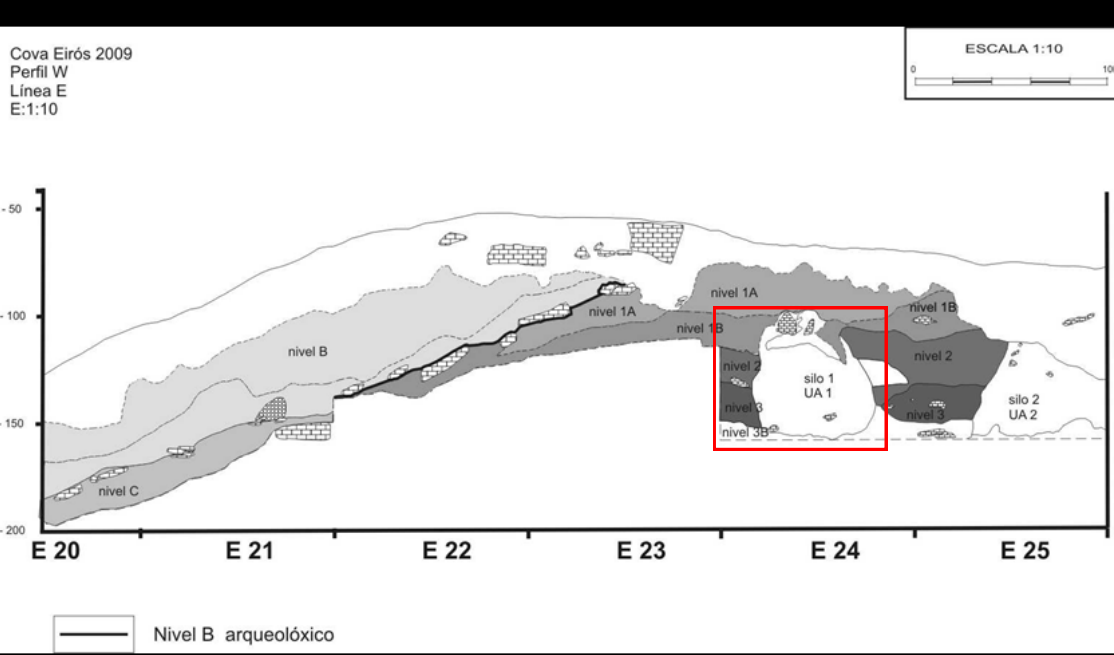
Middle Age	Method	TOTAL
Taxon	Manual Flotation	N° %
Salix/Populus	29	29 27,6
Betula sp.	2	20 22 20,9
Quercus sp. deciduous	15	15 14,2
Rosaceae/Maloideae	15	15 14,2
Ulmus sp.	7	7 6,6
Fraxinus sp.	6	6 5,7
Fabaceae	2	2 4 3,8
Castanea sativa	3	3 2,8
Corylus avellana	2	2 1,9
Prunus domestica/spinosa	1	1 0,9
Arbutus unedo	1	1 0,9
TOTAL TAXONS	3	10 11
TOTAL FRAGMENTS	5	100 105 100

There are various types of alterations in the analysed samples: entomofauna evidence in Quercus sp. deciduous and Rosaceae/Maloideae (2.9%), radial cracks in Quercus sp. deciduous, Ulmus sp. and Rosaceae/Maloideae (5.7%) and vitrification in Quercus sp. deciduous (1.9%). Among the analyzed fragments, there was a vessel handle used as firewood.

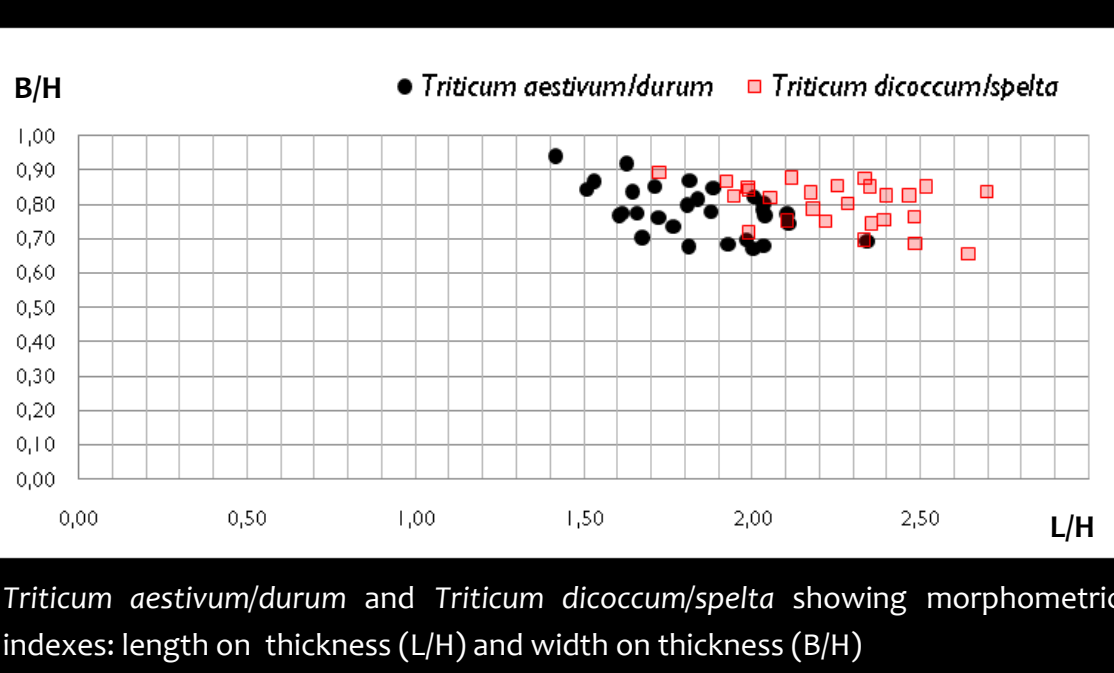
Several seeds of cultivated species also appeared, such as wheat grains Triticum aestivum/durum (n = 43), Triticum dicoccum/spelta (n = 36) and Triticum sp (n = 25), and in less extent barley (Hordeum vulgare) (n = 1). Also it is worth pointing out the presence of flax seeds (cf. Linum sp), as well as harvested fruits with 65 fragments of hazelnuts pericarps (Corylus avellana) found.

Conclusion

The charcoal analysis shows a diversified firewood collection. As well as in Cova do Xato, firewood was collected in the surroundings of the settlement: near the riverbanks, in the valley areas and at the foot of the mountains or scrub areas. In Cova Eirós there is also an opportunistic consumption of different types of firewood (manufacturing, seeds, etc.). During this time the landscape became very humanized due to the increase of farming fields and forest retreat (Gutián 2001), so it is also possible that firewood was collected from the hedges dividing the fields or riparian forests. Fires also favoured the woodland retreat and the growth of scrubs, therefore intensifying the human pressure on the mountains.



1) Vessel handle of Betula sp. 2 & 3) Triticum aestivum/durum and Triticum dicoccum/spelta 4) Fragmented achene of Corylus avellana. 5 & 6) cf Linum sp.



Triticum aestivum/durum and Triticum dicoccum/spelta showing morphometric indexes: length on thickness (L/H) and width on thickness (B/H)

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Related projects

- Human settlements during the Pleistocene period in the middle basin of the river Miño: HUM/2007-63662. Ministerio de Ciencia e Innovación.
- Settlements during the Middle Pleistocene/Holocene in the eastern regions of Galicia: HAR2010-21786. Ministerio de Ciencia e Innovación.
- Design and development of a data model for an archaeological SPI during the Galician Iron Age: (IDEPatr) 09SEC002CT. Xunta de Galicia.

5th International Meeting of Charcoal Analysis. Valencia, Spain, September 5th-9th 2011

