



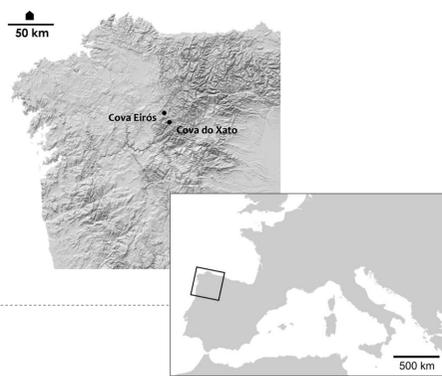
Archaeobotanical analysis in sedimentation deposits of Roman and Medieval pits in caves of the NW Iberia: Cova do Xato and Cova Eirós (Lugo, Galicia, Spain)

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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



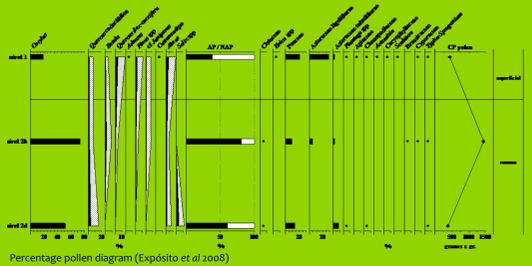
Results

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 Taxon	Method		TOTAL	
	Flotation	N°	N°	%
<i>Quercus</i> sp. deciduous	98	98	66,7	
Fabaceae	15	15	10,2	
<i>Fraxinus</i> sp.	14	14	9,5	
<i>Corylus avellana</i>	11	11	7,5	
<i>Salix/Populus</i>	2	2	1,4	
Rosaceae/Maloideae	2	2	1,4	
<i>Prunus</i> sp.	2	2	1,4	
<i>Ulmus</i> sp.	1	1	0,7	
<i>Arbutus unedo</i>	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.



Cova Eirós

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 tyloses were registered.

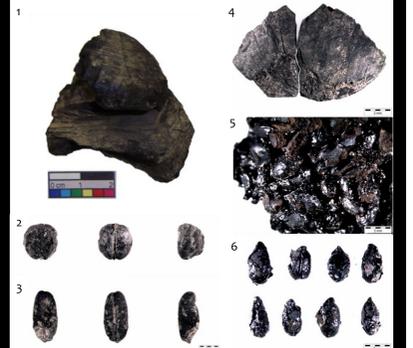
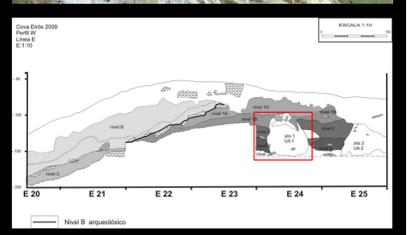
Middle Age Taxon	Method		TOTAL	
	Manual	Flotation	N°	%
<i>Salix/Populus</i>		29	29	27,6
<i>Betula</i> sp.	2	20	22	20,9
<i>Quercus</i> sp. deciduous		15	15	14,2
Rosaceae/Maloideae		15	15	14,2
<i>Ulmus</i> sp.		7	7	6,6
<i>Fraxinus</i> sp.		6	6	5,7
Fabaceae	2	2	4	3,8
<i>Castanea sativa</i>		3	3	2,8
<i>Corylus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

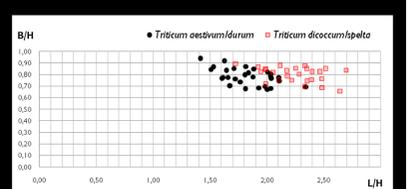
Several seeds of cultivated species also appeared, such as wheat grains *Triticum aestivum/durum* (n = 43), *Triticum dicoccum/spelta* (n = 36) and *Triticum* sp (n = 25), and in less extent barley (*Hordeum vulgare*) (n = 1). Also it is worth pointing out the presence of flax seeds (cf. *Linum* sp.), 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)

References

- EXPÓSITO, I.; YLL, E.I.; BURJACHS, F. 2008. Estudio palinológico del yacimiento de Cova de Xato (Folgoso do Caurel, Lugo). Report, 17 pp.
- FÁBREGAS VALCARCE, R.; ALONSO FERNÁNDEZ, S.; AMEJENDA, A.; GRANDAL D'ANGLADE, A.; LAZUÉN FERNÁNDEZ, T.; DE LOMBERA HERMIDA, A.; PÉREZ ALBERTI, A.; PÉREZ RAMA, M.; RODRÍGUEZ ÁLVAREZ, X.P.; RODRÍGUEZ RELLÁN, C.; SERNA GONZÁLEZ, M.R.; TERRADILLOS BERNAL, M.; VAQUERO RODRÍGUEZ, M. 2009. Novos resultados das intervencións arqueolóxicas no sur lucense. Os xacementos paleolíticos da Depresión de Monforte (Monforte de Lemos), Cova Eirós (Triacastela) e Valdavara (Beceerreá). *Gallaecia*, 28, 9-32.
- FÁBREGAS VALCARCE, R.; ALONSO FERNÁNDEZ, S.; LAZUÉN FERNÁNDEZ, T.; DE LOMBERA HERMIDA, A.; PÉREZ ALBERTI, A.; RODRÍGUEZ ÁLVAREZ, X.P.; RODRÍGUEZ RELLÁN, C.; TERRADILLOS BERNAL, M.; SERNA GONZÁLEZ, M.R.; VAQUERO RODRÍGUEZ, M. 2008. Aportacións ó estudo da Prehistoria da cunca media do Miño. Os asentamentos en cova e ó aire libre. *Gallaecia*, 27, 63-88.
- GÓMEZ FERNÁNDEZ, A.; VÁZQUEZ DOMÍNGUEZ, M. 2009. La ocupación romana del yacimiento de Castelo de Chás: "A Cova dos Mouros" (Olimbra, Ourense). *Gallaecia*, 28: 139-150.
- GUTIÁN RIVERA, L. 2001. La destrucción histórica del bosque en Galicia. *Sémata*, 13: 105-166.

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: (IDEPatRI) 09SECO02CT. Xunta de Galicia.

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

