



NEW DATA ON NAKED WHEAT IN THE EARLY NEOLITHIC LAKESHORE SITE OF LA DRAGA (BANYOLES, SPAIN). IDENTIFICATION ISSUES AND CROP PROCESSING TECHNIQUES

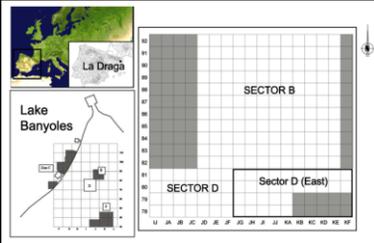
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Location: Banyoles, Catalonia
Altitude: 172 m a.s.l.



The site

La Draga is the only lakeshore site that is known in the Iberian Peninsula. It is dated to around 5350-5000 cal BC (c. 1000 years earlier than the first lakeshore sites from north of the Alpine chain) and at least two phases of Cardial Ware occupation have been identified. Waterlogged preservation only affects the earlier occupation phase (5350-5200 cal BC). This presentation focuses on the results of this settlement phase (sector D (East)).

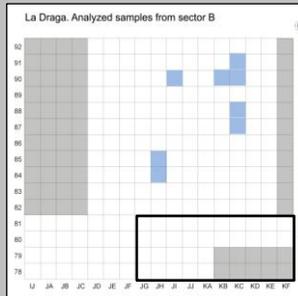


The sampling strategy

Fully quantitative analysis is time-consuming and can only be carried out on small samples. For this reason, **multiple sampling strategy** was designed:

- samples of 1l were taken per subsquare (50x50 cm)
- samples of 7-10 l were taken per square (1x1 m)
- 3 profile samples were obtained along the southern profile
- large bulk samples were water-sieved for semi-quantitative evaluation

This strategy provides fully quantitative data with a high spatial resolution as well as presence/absence data for large items represented in large bulk samples (ear fragments, capsulae fragments, hazelnuts, acorns...).



Crops and taphonomy

Several crops were identified:

- Cereals: *Hordeum distichum*, *Triticum aestivum* type, *Triticum durum/turgidum* type, *Triticum dicoccum*, *Triticum monococcum* and, most probably, the so-called "new" glume wheat.
- Poppy (*Papaver somniferum*).

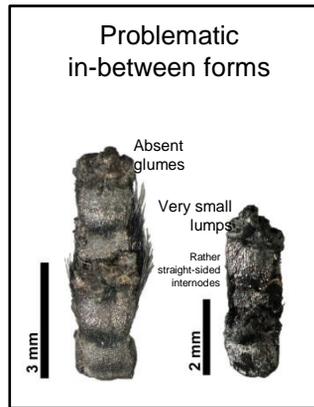
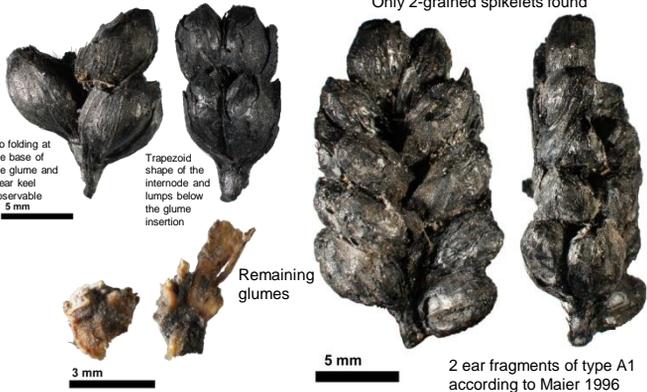
Cereals were majorly preserved in charred state, while poppy was mostly recovered in waterlogged state.

	LAYER VIIIb (below)		LAYER VIIa (above)	
	ch	wg	ch	wg
Cereals	562	183	7270	44
Poppy	1	2454	1	3271

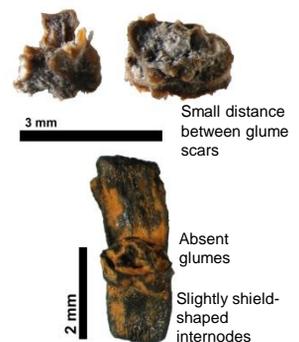
Identification of naked wheat chaff remains

Triticum durum/turgidum type

Only 2-grained spikelets found



Triticum cf. aestivum type



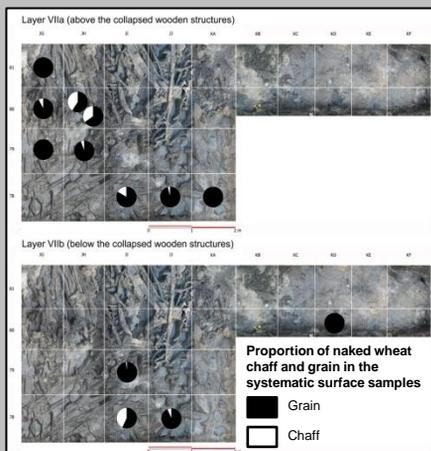
Naked wheat : new data

Naked wheat was the best represented crop. The average concentration value for the charred grains in layer VIIa was over 260 r/l (89.5% of ubiquity). The larger concentrations were found on the western side (probably an in situ burnt store).

Fragments of grain (including undifferentiated cereal) produced prior to charring were 4,5% of the total grain remains of square JG80 and 3,3% of JH80.

Charred chaff remains of naked wheat were also abundant. The largest concentrations of chaff (c. 130-550 r/l) were found in squares JG80 and JH80. An ear fragment of *Triticum durum/turgidum* type was recovered in the bulk sample of square JI80.

chaff (system. surface samples)	LAYER VIIIb (below)		LAYER VIIa (above)	
	ch	wg	ch	wg
Naked wheat (all)	55	28	756	20
4n naked wheat	44	26	490	20
6n naked wheat			2	



Naked wheat was probably the most important crop at the site, since our results corroborate earlier investigations (Buxó et al. 2000; Antolín and Buxó, 2011a).

The store of sector D is very interesting, given that some of the samples present a large proportion of chaff. The proportion of chaff is even higher than what should be expected for a storage in ear form. Besides, the significant presence of fragments of grain produced prior to charring indicates that the crop had been threshed. Consequently, it is possible that the crop was not winnowed or that chaff was used as isolation material in order to favour its long-term storage

Conclusions

Most of the naked wheat chaff recovered at La Draga seems to be of tetraploid type. This seems to be a common feature with La Marmotta site (Lake Bracciano, Italy), the other lakeshore site known for this period in the Western Mediterranean. Some possible hexaploid rachis fragments were identified, but no clear and characteristic examples of this taxon were observed.

A large number of chaff remains were recovered in sector D (east) of la Draga. It was concluded that this is due to the fact that a store was located in the western part of this area and that, even though the crop had been threshed, for some reason the chaff was left together with the grain. Such results were not observed in previous works, for which further analyses are needed in order to interpret this find as a unique assemblage or as a crop storage technique practiced at the site.