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1. RIPARO BOMBRINI

The collapsed rockshelter located in the Balzi Rossi spans two distinct proto-aurignacian levels dated from **40 to 36 thousand years cal BP** corresponding to 5000 years of continuous occupations. Previous studies showed variable technological organization and mobility strategies that seem to be correlated with a shift from colder to warmer conditions from Level A2 to Level A1 [1,2].

Taphonomic analyses reveal the extensive level of fragmentation on the site, partly caused by soil compactions from the railway bisecting the site and built during the 19th century using dynamite. This context is ideal to utilise the novel ZooMS [3] method to identify morphologically unidentifiable bones and enhance faunal NISP statistical significance. This paper aims to show preliminary faunal results compared with current mobility hypotheses in A1 and A2.

2. MATERIAL & METHODS

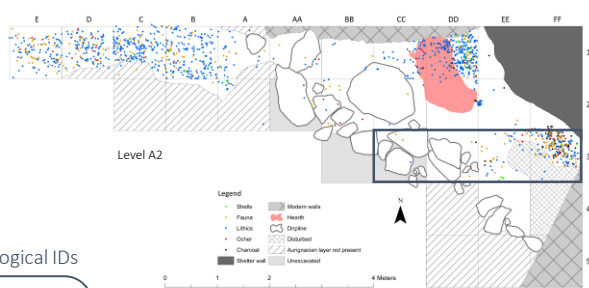
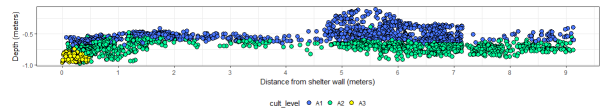
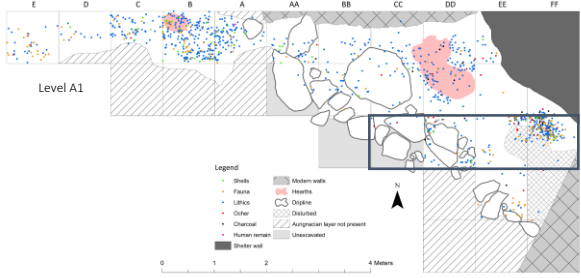
Over 15 000 bone fragments distributed in both layers were collected and analyzed for taphonomic effects and archeozoological identifications. 194 bone samples were than collected for ZooMS analyses (A1:n=84, A2: n=110) carried out at the University of Manchester (UK). All samples come from four squares (CC3 to FF3) from the past three years of excavation (2015-17).



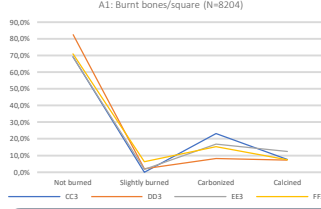
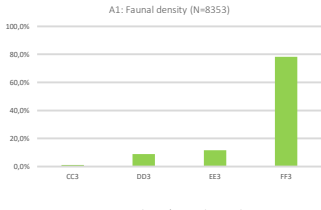
Balzi Rossi, Liguria, Italy

3. RESULTS

Comparing proto-aurignacian levels A1 and A2

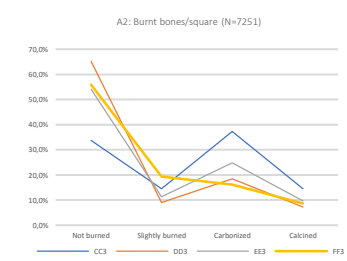
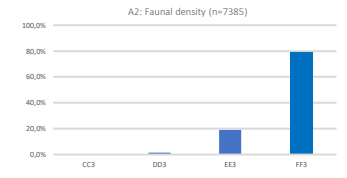
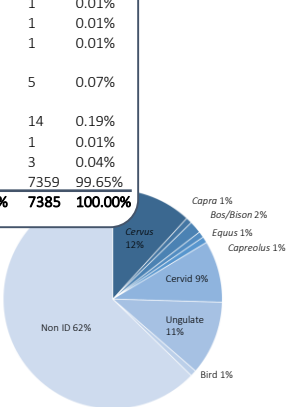
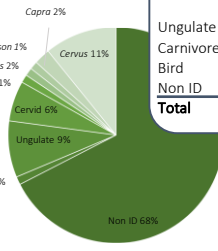


Morphological IDs



Previous studies have suggested that A1 shows a residential land-use strategy, and A2 shows a more logistic strategy. Both levels were occupied as base camps, but A2 seems occupied during longer periods shown by further ranges of exotic raw material procurement and bladelets are longer and narrower than A1 in which a more curated lithic organization is displayed. Faunal data are in overall agreement with those models. Both layers show a high bone concentration in FF3 corresponding to a discard structure, but burnt bone patterns diverge in A2 possibly indicating more spatially organized occupations originating in A2. Faunal spectra show similar patterns where hunter-gatherers seemed to prefer hunting Red deer while not exclusively focusing on one species. Furthermore, carnivore traces are very scarce which is in agreement with continuous occupations throughout both proto-aurignacian levels.

Taxa	A1	%	A2	%
<i>Equus</i>	1	0.01%	1	0.01%
<i>Sus scrofa</i>	0	0.00%	1	0.01%
Bovid S3	0	0.00%	1	0.01%
Ungulate S2-3	0.00%		5	0.07%
Ungulate S3-4	4	0.05%	14	0.19%
Carnivore S3	0.00%		1	0.01%
Bird	1	0.01%	3	0.04%
Non ID	8347	99.93%	7359	99.65%
Total	8353	100.00%	7385	100.00%



4. DISCUSSION

While the ZooMS is the best choice of method in Bombrini's taphonomic context, the poor bone preservation is such extensive that it heavily affected collagen preservation as well (>60% Non ID). Consequently, a screening method that could benefit all poorly preserved Paleolithic sites is currently being developed to assess collagen preservation using a minimally destructive spectroscopic technique (1mg). However, even without a screening process, ZooMS spectra are far more revealing than morphological IDs, and could inform us with occupation seasonality and diet breadth. Further analyses will assess the question of carcass processing and body part transport, although those behaviours are difficult to discuss in such context, they are crucial to understanding land-use strategies and peopling dynamics.

5. CONCLUSION

- Cited sources
- [1] Riel-Salvatore, J., Negrino, F., 2018a. Proto-Aurignacian Lithic Technology, Mobility, and Human Niche Construction: A Case Study from Riparo Bombrini, Italy. In: Lithic Technological Organization and Paleo-environmental Change, Studies in Human Ecology and Adaptation. Springer, Cham, pp. 163-187.
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 - [3] Buckley, M., Collins, M., Thomas-Oates, J., Wilson, J.C., 2009. Species identification by analysis of bone collagen using matrix-assisted laser desorption/ionisation time-of-flight mass spectrometry. Rapid communications in mass spectrometry. 23, 3843-3854.