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# Environment and subsistence strategies at La Viña rock shelter and Llonin Cave (Asturias. Spain) during MIS3

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## Abstract

The sites of La Viña and Llonin have an important archaeological sequence corresponding to Marine Isotope Stage 3: Mousterian, Aurignacian and Gravettian periods. La Viña is a complex site with continuous occupations but, at least during Mousterian and Aurignacian, it was affected by important alterations due to its morphology and the physical processes involved; while Llonin mainly consists of a sporadic human occupations. The current multidisciplinary research has allowed us to obtain and match several data: site formation processes, fauna and stable isotopes, vegetation, radiocarbon, shell ornaments, lithic raw materials and technology, offering an interesting frame of two separated ecological

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niches: mountainous (Llonin) and open river valley (La Viña). During the Mousterian the faunal composition of La Viña is scarce but dominated by red deer followed by chamois, while large mammals are absent. At the Aurignacian red deer and chamois are also represented within a larger assemblage, together with a low representation of other taxa such as horse, bovines, Spanish ibex and roe deer. In Llonin chamois and Spanish ibex dominate, followed by red deer. Carnivores are represented by bear, fox and wolf at La Viña, as well as in Llonin besides of hyena, dhole and leopard. La Viña ungulates show evidences of anthropogenic modifications including cut marks, fresh breakage and thermo-alterations. At Llonin is an accumulative alternation of different carnivores and human events with a limited human activity. Charcoal and microfauna analysis shows an open landscape, dominated by heliophilous, pioneering species characteristic of the montane biogeographical belt. *Sorbus*, birch and Scots pine are especially important as well as a shrubland mainly dominated by leguminous. The environment seems to be more arid and open in Mousterian levels, more forested and humid during the Aurignacian and cold in the Gravettian. Quartzite is the main raw material in both sites during MIS3. Its catchment is basically local during Mousterian and broaden in the Aurignacian and Gravettian incorporating local, semilocal and foreign flints for blade and bladelet production.

**Keywords:** Paleoclimatology, Economy, Mobility, Taphonomy, Human/Carnivore occupations