NEW DATA ABOUT POLLEN AND FIRE REGIME IN CANTABRIA (NORTHERN SPAIN) FROM THE LATE GLACIAL TO THE PRESENT

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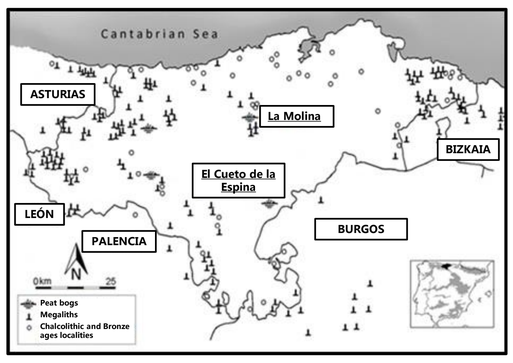
INTERNATIONAL BIOGEOGRAPHY SOCIETY

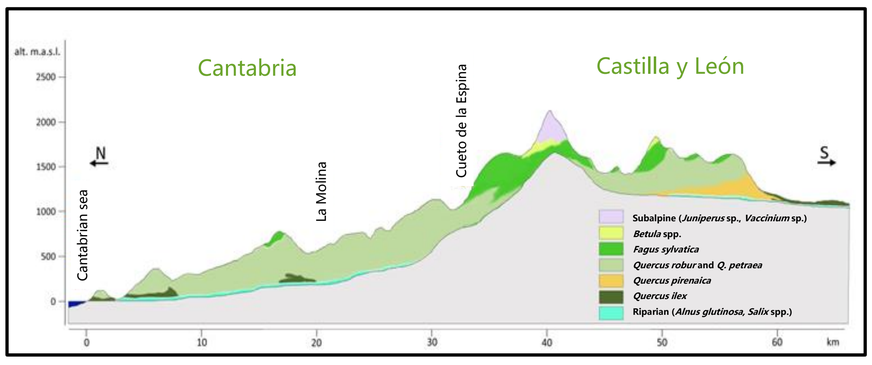
CONTEXT

The evolution of mountain landscapes during the Late glacial and the Holocene is explained by a multifarious interaction system between **society** the **environment**, where **fire** has played an essential role. The **Cantabrian mountain,** which is one of the European regions with more known Palaeolithic sites, has proved to be an excellent laboratory for the study of past fires, since the study of **charcoals, pollen and non-pollen palynomorphs (NPPs)** has provided information about fire regime and the vegetation dynamics. In this poster new data from two Cantabrian sedimentary records (La Molina peat bog and El Cueto de la Espina peat bog) are presented, which complement the available data for the last 6740 years (Pérez-Obiol et al., 2016) and demonstrate the uninterrupted contribution of fire on landscapes during the last **17550 years**.

STUDY SITES AND SAMPLING CAMPAIGNS



Underlined toponyms: peat bogs. **Non-underlined toponyms:** Provinces of Spain.



El Cueto de la Espina
1113 m a.s.l.
Extraction of 255 cm
5727 Cal yr BP

La Molina
484 m a.s.l.
Extraction of 499 cm
17550 Cal yr BP

METHODS

^{14}C Dating

3 ^{14}C in El Cueto de la Espina

10 ^{14}C in La Molina

Pollen

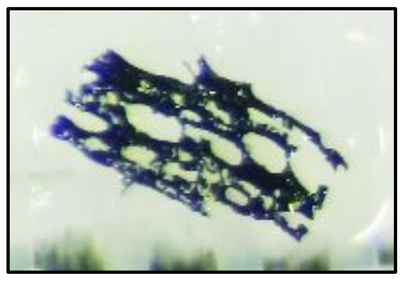
Artemisia sp.

Non-pollen palynomorphs

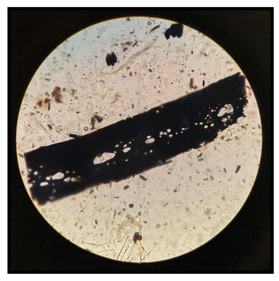
Sordaria sp.

Loss on ignition (LOI)

Macrocharcoal (>150 µm)



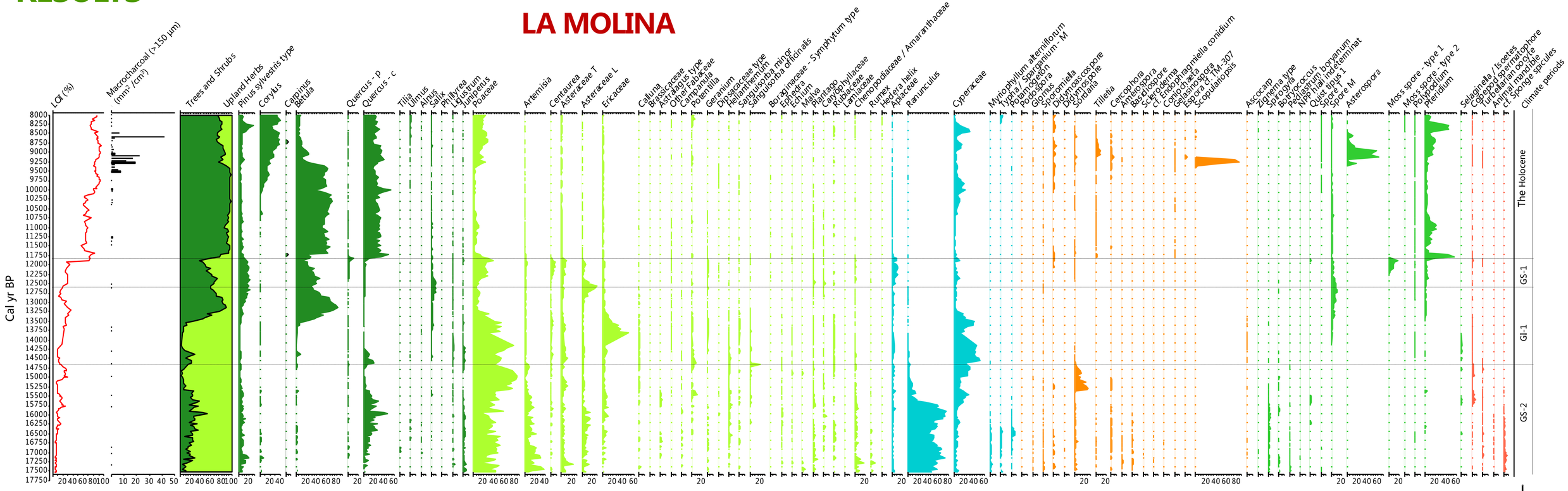
Microcharcoal (on pollen slides)



Samples were burnt 4h at 450ºC

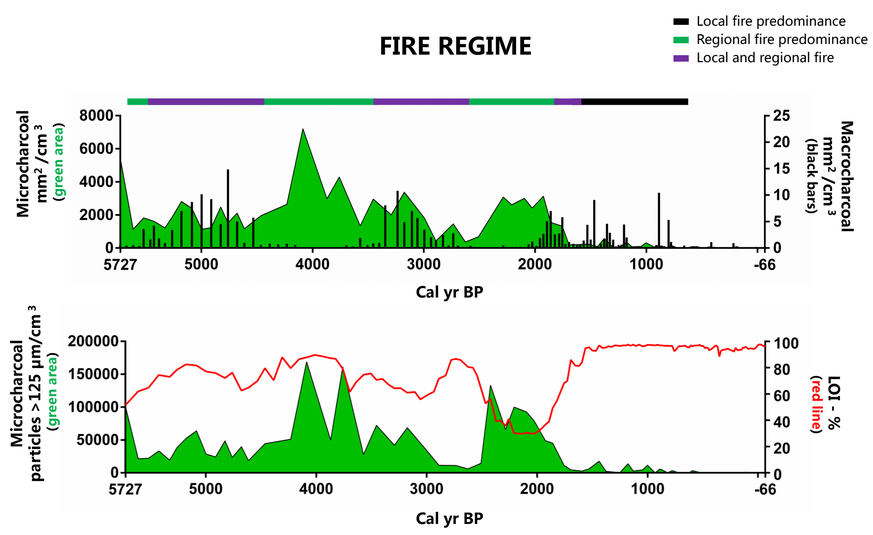
RESULTS

LA MOLINA



Isotopic events: Greenland Stadials (**GS, cold episodes**) and Interstadials (**GI, warmer episodes**) according to the GRIP ice core (Walker et al., 1999)

EL CUETO DE LA ESPINA



CONCLUDING REMARKS

- Sedimentary charcoal (>150 µm) and microcharcoal suggest an uninterrupted presence of fire during the last 17550 years in Cantabria. The combination of both proxies indicates that **local fire events** did not always coincide with **the regional fire regime**.
- Low charcoal concentration is detected through all the Palaeolithic section of La Molina record due to **low fuel availability**, because of a lack of woody plants.
- According to the sedimentary charcoal values (>150 µm) **fire events increased in intensity at the beginning of the Holocene**. In particular, at la Molina increased at 9500 cal yr BP, coinciding with the beginning of fires in certain regions of the Pyrenees (Cunill et al., 2013). This inflexion point coincided in La Molina with the expansion of woody species.
- Some researchers point out that some fire events could have been the result of **human activity** during the Holocene, while other fires could have been more influenced by **climate**.
- From the onset of Neolithic, charcoal peaks became frequent at El Cueto de la Espina coinciding with the start of **productive activities** in the North of the Iberian Peninsula, such as grazing or agriculture. This dynamics coincides with the history of fires in La Molina for the last 6740 cal yr BP (Pérez-Obiol et al., 2016).
- **Peaks of microcharcoal particles bigger than 125 µm** did not coincide in time with the local fire events (obtained from sedimentary charcoal >125 µm), but with the regional fire regime obtained from the counting of microcharcoal on pollen slides.

REFERENCES Pérez-Obiol, R., García-Codron, J. C., Pèlachs, A., Pérez-Haase, A., & Soriano, J. M. (2016). Landscape dynamics and fire activity since 6740 cal yr BP in the Cantabrian region (La Molina peat bog, Puente Viesgo, Spain). Quaternary Science Reviews. 135(1): 65-78. // Walker, M.J.C., Björck, S., Lowe, J.J., Cwynar, L.C., Johnsen, S., Knudsen, K.-L., Wohlfarth, B. & INTIMATE group (1999). Isotopic events' in the GRIP ice core: a stratotype for the Late Glacial. Quaternary Science Reviews. 18 (10-11): 1143-1150. // Cunill, R., Soriano, J. M., Bal, M. C., Pèlachs, A., Rodríguez, J. M. & Pérez-Obiol, R. (2013). Holocene high-altitude vegetation dynamics in the Pyrenees: a pedoanthracology contribution to an interdisciplinary approach. Quaternary International. 289: 60-70.

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GRAMP

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